SPECIAL LIVESTOCK ISSUE

Contents for October 1959

Are Your Hogs Over-Corned?	Farm and Ranch	1
Aureomycin Holds Down Calf Scours*	Wyoming University	3
Your Easiest Income Is from Crops	Plant Food Review	4
Where We are on Feed Additives	Prairie Farmer	8
What's Behind the Push for Pellets?	Nation's Agriculture	11
Fun on the Farm	Collected	17
Enzymes, Newest Beef Gain-Boosters	Farm Journal	20
Make Layers Eat More*	Florida Extension	22
Ton of Beef Per Acre from Grass	The Progressive Farmer	23
What About "Contract Milking"?	Successful Farming	27
Veterinary Instruction Service: How To Castrate Pigs	Editors	32
Rearing Orphan Animals	Journal of Agriculture of Western Australia	35
Records Cut Poultry Costs*	Indiana Extension	40
Do Your Hens Get Enough Energy?	Everybody's Poultry Magazine	41
Why Antibiotics Promote Growth*	University of Wisconsin	45
Tail Biting Cure Found	National Hog Farmer	46
Selling Light, Profitable for Hog Producers*	Newsletter	51
Don't Let "Robbers" Take Your Sheep	American Agriculturist	52
Don't Hide Your Light*	The Ayrshire Digest	53
"Spring Grass" 8 months of the Year	Capper's Farmer	54
Fast-Gaining Bulls Sire Fast Gaining Calves*	University of Illinois	57
Iron Deficiency and Anemia in Pigs	Farming in South Africa	58
High Moisture Corn	Indiana Farmer	60
High Moisture Corn Gives Good Lamb Gains*	University of Missouri	63
50 Years of Feeding Progress	Western Livestock Journal	64
Feeding the Young Pig	Breeder's Gazette	70
Ear vs. Shelled Corn When Ground for Pigs*	Hampshire Herdsman	72
How Much Fiber in The Ration?	Pig Farming	73
Beef Cattle Do Well at Self-Feeding Bunkers	Kansas Farmer	77
Lime Improves Field Crops*	Louisiana State University	79
Corn Feeding Comparisons	The Shorthorn World	80
We need to Remodel Our Livestock	Massey-Ferguson Farm Profit	83
Farm Market Holds Its Own*	Wall Street Journal	85
Tranquilizers and Livestock	The A. I. Digest	86
Artificial Chick Controls Brooder*	Agricultural Extension	88
Pregnant Sows Need Special Care	Wisconsin Agriculturist	89
One Calf Per Cow Per Year	Vermont Farm & Home Science	91

*Short Features in this Issue. One Year Continuing Index, pages 94 & 95

THE FARMER'S DIGEST

Route 2 **FORT ATKINSON, WIS.**

Editor and Publisher — Hugh Highsmith

Associate Editor — D. W. Scheid

Livestock Editor — Al Haller

Office Manager — D. W. Wittenwyler

Subscription Service — E. M. Hartwig, V. M. Binkert

Industry Sales — Raymond C. Groendyke

Published monthly, except June-July and August-September, when published bi-monthly at Fort Atkinson, Wisconsin by The Highsmith Co. Inc.

Subscriptions in U. S., U. S. Possessions and Canada: One year $3.00, two years $5.50, three years $7.75.

Subscriptions to Other Countries: One year $3.50 two years $6.50 three years $9.25

ADVISORY EDITORIAL STAFF

William A. Albrecht, Chairman Department of Soils, U. of Mo.

Hugh H. Bennett, Ex-Officio, Soil Conservation Society of America

G. B. Gunlogson, Agricultural Engineer

H. J. Reed, Dean of the School of Agriculture, Purdue University

T. J Rutherford, Director, Veteran's Land Act, Ottawa, Canada

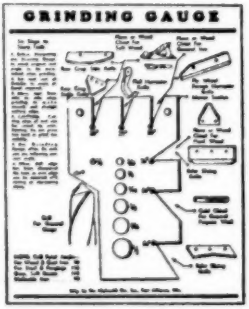
W. T. Spanton, Chief of United States Ag Education Service

POSTMASTER: Send notice on POD Form 3579 to Farmer's Digest, Route 2, Fort Atkinson, Wis. Entered as second-class matter at the Post Office at Ambler, Pa., July 30, 1948, re-entered at Fort Atkinson, Wis., additional entry at Jefferson, Wis. under the act of March 3, 1879. Printed at Jefferson, Wis.

CUTTER-SCRAPER TOOL

Cleans spreader beaters. Scrapes plow and cultivator shovels. Cuts weeds and briars. Opens bales. Cutlery steel head has knife-sharp cutting hook, broad scraping edge. 20" long. Hardwood handle. Order one for each tractor. $1.69 each. Two for $3.00. THE HIGHSMITH CO. INC. Fort Atkinson, Wisconsin.

For Your Farm Shop — New Grinding Gauge



Do a better job on less fuel. Grind cutting edges to correct angle. Aluminum template has seven angles for sickles, knives on mowers, choppers, trail harvesters, balers, cold chisels, planes, etc. To use, slip template angle over cutting edge and grind accordingly. Also for sharpening drills, hole sizes from 1/8" to 1/2", instructions. On handy wall card. Money back guarantee. 40¢ each. Three for $1.00. Postpaid. THE HIGHSMITH CO. INC., Fort Atkinson, Wis.

PIG & CALF CASTRATING KIT

With New Castra-Knife, Illustrated Instructions, Lanyard, Etc.

Do your own castrating and do it right. Half a litter or one calf pays for this kit. The new castra-Knife is a sharp, handy, safe razor-blade cutter. Unlike old type castrators, it is always super sharp for a fast, sanitary, humane job. It is safer for you and the animal because blade sets to limit depth of cut, also retracts and is shielded when not in use.

Authorities say illustrated instructions are best ever prepared covering old scrotal sac operation and new college-approved, simplified ventral incision method. Plastic lanyard cord with swivel suspends knife from clothing to free hands between operations. Saves time and avoids contamination Kit also includes five extra blades and a plastic case. Order from this ad. Send only $1.29. Postpaid. Money back guarantee.

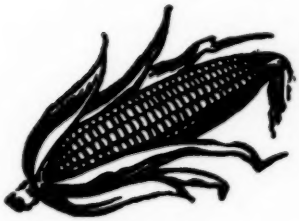
THE HIGHSMITH COMPANY

Fort Atkinson 21, Wisconsin

The Farmer's Digest

Volume 23 October 1959 Number 4

Are Your Hogs Over-Corned?



Interview with a hog man from Denmark.

Condensed from
Farm and Ranch

Bill Kennedy

WHEN he came to this country for a visit, he came knowing we would have many answers on how to get the most hog gain in the shortest time with the least amount of feed. But he wasn't prepared for the shock he got when he ordered pork chops in the U.S. This Dane thinks we have a lot to learn about quality pork and how to produce it.

That's what Dr. Hjalmer Clausen, noted swine nutritionist from Denmark said following a presentation he made at a recent Research Conference in Indiana.

"In my country the farmers' very existence and everybody's welfare depend upon the export market," he went on. "We could not sell our pork in other countries—competing with local production, and at premium prices—except for one reason. Ours is better meat.

"If we did not produce the very best pork our farmers would be out of business. Naturally we do not find the same kind of quality elsewhere. We are, fortunately for us, years ahead in both breeding swine and in feeding."

In his brief talk at the conference, Dr. Clausen told about his disappointment when he ordered the first of our "fat pork chops." He then went on to explain what was wrong with it. Even if it started out as a pretty good pig, he said, the animal had

Reprinted by permission from Farm and Ranch, 318 Murfreesboro, Nashville, Tennessee

too much fat fed into it.

He explained how he can tell from the chop whether a hog has been properly fed; said extra layers of fat can be added by too much of the wrong kind of grain, or the wrong combination of proteins.

Then he outlined one of his own recent experiments in feeding. Using pigs from the same litters, feeding them the same grain ration and the same *level* of proteins . . . he reported that he was able to vary the ratio of fat to lean in the pork chops by nearly 40%, merely by changing the type (or source) of protein supplement. Best-fed hogs

Anybody can make money, but it takes a wise man to live a worthy life.

in the tests had only 103% as much fat as meat in the chops; others went as high as 139%. "These last are no good," he added.

"All Corn Makes a Fat Hog"

Asked in open session whether our greatest lag is in breeding or in feeding, Dr. Clausen gave a diplomatic answer; said the same thing we tell our freshmen in agricultural classes:

"First you have to have a good pig. Then you have to feed him the right kind of ration."

But later, in private, he warmed to the subject. The interview went about like this:

Question: Dr. Clausen, what do you think is our weakest link in efforts to produce sure 'nough quality pork in the U.S.?

Answer: That is not for me to say. But I will say this . . . If I were put in charge of a swine operation in this country I would select the best animals I could find, yes; but I would surely change the way they are being fed.

Q. What changes would you make?

A: First, I would cut down on the corn. You cannot produce the best quality pork with corn as the only grain. Corn makes a fat hog.

D: But corn is our most plentiful grain; easiest to grow; and probably the most economical feed we have for hogs . . .

A: I don't mean I wouldn't make use of your corn. But you can produce other grains, too.

Q: How much corn could you use and still produce what you call good quality pork?

A: Perhaps about 70% of the grain. No more.

Q: And what would you use for the other 30%?

A: I think I would start with 70% corn and 30% barley.

Q: What about the protein supplements?

A: That I would have to determine by testing the various animal and vegetable proteins

available — as your feed companies are doing. You have some good ones. But I would be more concerned with the kind of gain; not just the rate of gain, or amount of gain per pound of feed. Fat is easier added to the carcass than good lean meat.

Q: Dr. Clausen, under our usual marketing setup the farmers are not paid big premiums for extra fine quality. How about that?

A: Farmers will not produce quality meat so long as they can sell lower quality for the same price. But once the consumers learn what good meat tastes like they are willing to pay for it. Do they not buy Danish meat at import prices? And then the farmer can be paid for the trouble it takes to produce quality pork.

Q: Is selling on carcass grade the answer?

A: One answer, yes. Carcass grading is the only way to detect real premium quality. Back probing is not enough.

Why does Dr. Clausen talk so freely about his country's "secrets" to success in exporting pork? Because he knows there is a long way between the telling and the doing. Denmark has been concentrating on this quality business for generations. It will take a long time for even her closest neighbors to catch up, as some of them here for this international meeting reluctantly admitted.

Aureomycin in Calf Rations Holds Down Scours

Calf scours, a real problem with dairy calves, has bowed its head to aureomycin, according to I. W. Slater, Wyoming University extension dairyman.

Aureomycin fed to dairy calves in U.S.D.A. feeding trials at Beltsville, Md., consistently held down scours, Slater says. Control calves—not fed aureomycin—had scours, and some died during the trials.

Other effects of feeding aureomycin to young calves included increased gains, stimulated appetites, and increased feed efficiency. After the calves are 2 months old, the benefits don't offset the cost of feeding aureomycin, Slater points out.

Aureomycin-fed calves averaged 19 pounds per head more gain than controls at end of the 90-day trial period.

When scientists stopped feeding the antibiotic the test calves gained less rapidly than the controls. By six months of age, the controls caught up with the aureomycin-fed calves.

—Wyoming University

Your Easiest Income Is from Crops

Crops utilize to best advantage the farmer's resources of land, labor, capital, and management . . .

Condensed from Plant Food Review

Lauren H. Brown

SOME farmers seem to overlook the importance of the cropping end of their business because on most general crop and livestock farms, direct income is derived primarily from the sale of livestock and livestock products.

Actually, as borne out by recent studies, 60 to 70 per cent of net farm income usually is due to the cropping system, while only 30 to 40 per cent results from "putting the crops through livestock." As for labor, the relationship is reversed. The crops program usually requires only 20 to 40 per cent of the labor input while livestock accounts for 60 to 70 per cent.

These comparisons are made here—not to generate a controversy between crop and livestock interests—but simply to emphasize to farmers the importance of devoting sound management attention to their individual cropping programs as well as to their livestock enterprises. Increased efforts in this direction will usually net greater returns for the farmer.

Crops vary in yields per acre and in value, and there are a number of reasons for this. Weather and inherent land quality are two factors over which the farm operator has little control. There are, however, two areas of crop production over which the farmer has a great deal of control.

First, he can select the types of crops to be grown. This can have considerable influence on value of crops produced. In general, the rule should be to produce as high an acreage of high valued crops as is consistent with good land use. In other words, make each acre yield the greatest return in value that is

Reprinted by permission from Plant Food Review, National Plant Food Institute, 1700 K Street, N.W., Washington 6, D. C.

possible. For example, in one area of Michigan which we have studied, the high value crops are corn, wheat, and a good stand of alfalfa hay. In other areas, sugarbeets, beans, soybeans, canning crops, and others would be included.

Although the growing of high value crops frequently requires careful use of cover crops, working across the slopes, contouring, terracing, drainage or possibly irrigation, such essential practices pay their own way in helping the farmer produce consistently good yields of adapted high value crops.

The second group of factors over which farm managers exercise great control are production practices—those methods which affect crop yields. Last year we conducted a study involving 61 farms located in one fairly uniform county. We found that crop yields varied from 40 per cent below average to 50 per cent above the average.

Some of the more important production practices which have direct bearing on crop yields are:

1. **Using correct amount and analysis of commercial fertilizer along with available barnyard manure and crop residues. This calls for a planned program of soil testing, and crop production records for each field.**
2. **Maintaining the levels of pH in the soil that are ideal for those crops to be grown.**
3. **Maintaining good soil structure through recommended rotation and tillage practices.**
4. **Using adapted varieties of high quality seed at correct planting rates to attain the recommended stand of each crop.**

In recent years, the Michigan Agricultural Extension Service has gathered and analyzed farm account information from a representative sample of Southern Michigan dairy farms. From this data, we have assembled the following budget.

One farm which will serve as an example is a family-operated unit of 200 acres, of which 160 are tillable. It has a dairy herd of 30 cows. Labor includes one full-time operator plus another worker for about 6 months of the year. The total investment (depreciated basis), exclusive of the farm residence, is $60,000 or approximately $2,000 per cow.

The cropping program includes about 38 per cent of the land in corn, 50 per cent in hay and tillable pasture, and 12.5 per cent in wheat. Wheat follows silage corn in the rotation, and alfalfa seedings are made following wheat. All cropland is covered with barnyard manure once in five years and also receives an average of $10 worth of commer-

cial fertilizer per tillable acre per year.

The farm grosses an estimated $17,000. This includes $12,600 from the sale of milk; $2,000 from the sale of cattle and calves; and an additional income of $2,400 from marketing wheat and surplus corn.

Expense items total $12,900 and include cash expenditures, the value of labor contributed by the operator and other family members, and depreciation on machinery and buildings. Expenses have been allocated to the crop and livestock program as equitably as possible.

The cropping program on our sample farm produced $55 worth of crops per acre. In the same area of the State, record-keeping farms produced from $30 to $80 worth of crops per acre in 1958. Livestock can do only so much with the feed available to it. For the average farmer, a good standard for a dairy herd is a return of $1.60 to $2.20 for every dollar's worth of feed. For hogs, it runs from $1.35 to $1.80. For feeder cattle, it is $1.20 to $1.60, and for beef cows, it ranges between $1.00 and $1.25.

Heifer calves should be officially vaccinated for brucellosis between the ages of 120 and 129 days, say veterinarians. Removal of extra teats and dehorning during the same operation reduces time, labor and expense of extra handling.

The farming operation we have used for illustrative purposes is summarized in Table 1. The total net figure of $4,100 is the amount left for return to capital and management.

On the basis of the above estimate, 66 per cent of the net income is attributable to the cropping program and 34 per cent to the livestock operation. On the other hand, it is estimated that 69 per cent of the farm work was expended on livestock and only 31 per cent went to crop production. It should be pointed out, however, that if hog and beef operations had been used,

INCREASED NET INCOME FROM CROPS

Table 1: Summary of gross income and expense for sample dairy farm.

	Gross	Expenses	Net[1]	Per cent of Net
Crop value	$ 8,800	$ 6,100	$2,700	66
Value added by livestock ..	8,200	6,800	1,400	34
Totals	$17,000	$12,900	$4,100	100

[1] Amount left for return to capital and management.

the relative importance of the cropping system would have been further enhanced, because the return above feed cost on such farms is less than for dairy farms.

For purposes of illustration and comparison, we have pulled apart a particular farming operation. Here we have separated the cropping program so as to take a closer look at it. Frequently, it takes both crops and livestock to utilize to best advantage the resources of land, labor, capital and management that go into a farming business.

Grass Silage 1885 . . . and Now

Methods of preserving forage crops for hay and grass silage have come a long way since ancient times when people along the Mediterranean Sea preserved silage by storing grass in air-tight chambers.

John W. Bratzler, animal nutritionist at Penn State, says chemicals were first used to preserve grass silage in 1885. Since then four methods have been developed for making grass silage—wilting; addition of molasses, ground cereal grains, and beet of citrus pulp; use of chemicals such as sulfur dioxide, sodium metabisulfite, Kylage, and sodium sorbate; and addition of flavoring compounds with or without common salt.

Dr. Bratzler said he believed many farmers were oversold a few years ago on the idea of making grass silage. Where the weather is ideal for the field curing of hay, there is no advantage to preserving the crop as grass silage, he pointed out.

"Management, as with all farm operations, plays a very important part in how successful the individual farmer is in making grass silage," he stated.

"Forage must be harvested when it is highest in total feeding value, the silo must be filled rapidly and, if used, a preservative must be distributed uniformly throughout the ensiled forage. Not enough attention is given to these important factors," he added.

Dr. Bratzler concluded that future progress in preserving forage crops for hay or grass silage will depend on the development of better methods for preserving grass silage, better methods for eliminating seepage from silage, and on more efficient hay drying systems. —*George Van Horn* in ***American Agriculturist***

Where We Are On Feed Additives

The search goes on . . .

Condensed from Prairie Farmer
Jim Lilly

THE 1950's will be remembered as the era of feed additives for agriculture.

Most of the additives used in livestock feeding made their first appearance and came into common use during the past seven or eight years.

There's no doubt that feed additives have meant a lot to livestock growers. Tiny amounts of material in a ton of feed can increase gains and improve feed efficiency dramatically.

Additives have also made better breeding a necessity. It takes top-notch animals to take advantage of the high rate of gain now possible.

There are some other sides to the feed additive picture, too. Colleges and universities are now trying to find out why livestock responds to many common additives. Researchers haven't made a lot of progress in this direction.

Learn New Things

They have learned some new things about the digestive processes of cattle and hogs. This has led to a more complete understanding of how animals utilize feed.

Colleges and universities are also running extensive tests on both new additives and different combinations or levels of old ones. This is a valuable service to both farmers and additive manufacturers. However, the tests of one university may conflict with those of another. This can happen even using similar animals and rations.

The livestock feeder is usually wise to heed the tests where feeding conditions closely approximate his own program. Or he may wish to do some experimenting on his own.

The following information on additives was gathered largely from animal nutritionists at the University of Illinois and Purdue University. Most of the additives discussed have shown consistent up or down trends in rate of gain and feed efficiency.

Hormones Show Gains

The hormones have proved to

Reprinted by permission from Prairie Farmer, 1230 Washington Boulevard, Chicago 7, Illinois

be a real help to cattle feeders. Nearly every college in the country has tested various types with cattle. The vast majority of tests have shown a consistent increase in gain and feed efficiency.

Hormones for cattle can be handled two ways. One method is to feed a small amount daily in the supplement. The other involves implanting the material under the skin around the ear.

GRASS ROOTS

He who plows a furrow, Who turns the sod, Finds himself closer, To life and to God.
Adeline Roseberg, Minnesota
The Furrow

Either method gives good results although there is disagreement about the relative costs. Illinois reports hormones have given an average increase of 12 per cent in rate of gain and 15 per cent in feed efficiency.

Growth hormones for hogs haven't done so well. Purdue researchers have been unable to get any consistent rate of gain increases with hormones, either alone or in combination. They are continuing their hormone work with hogs, however.

Antibiotics in hogs are a different story. The first additives to hit the livestock industry in a big way were the antibiotics. They have been highly successful in swine rations and the outlook for their continued use is good. Rate of gain increases in the past from antibiotics have been in the 10 to 20 per cent range.

A community should have 4½ hospital beds per 1000 population to take care of normal needs.

Some feeding tests have indicated that the older antibiotics may be losing punch with hogs. Recent Illinois tests seem to bear this out.

You can get around this problem in two ways. First, you can go to a combination of older antibiotics. The Illinois tests indicate rate of gain can be bounced back to accustomed levels by combining the materials.

Second choice is to switch to some of the newer antibiotics now on the market. Again, Illinois tests found the new compounds gave substantial gain increases compared to control lots of pigs that received no antibiotics.

For feeder cattle, antibiotics have been less impressive. Purdue has been able to get consistent gain increases, particularly with high-roughage rations, from the common antibiotics. Past Illinois feeding tests have never shown any great advantage in feeding antibiotics to cattle.

Based on some of their most recent test work, Illinois nutritionists say antibiotics probably will pay their way for cattle under typical feedlot conditions. In high-roughage rations, they have noted a gain increase of roughly 10 per cent.

Antibiotics and Dairy Cattle

Regular feeding of antibiotics to dairy cattle has been approved only for a short time. Most of the tests so far indicate antibiotics in dairy rations won't significantly increase milk production. Antibiotic feeding at the maximum rate of 0.1 milligram per pound of body weight has been approved for control of foot rot and bacterial diarrhea. Feeding young calves antibiotic compounds will cut down on the scouring problems.

The U.S.S.R. is the world's largest contiguous state, occupies 15% of the world's land area, reaches 6,000 miles east and west, and is about twice the size of United States.

Another broad class of feed additives are the anti-bacterial and chemobiotic compounds. These range all the way from the sulfa drugs to the arsenicals.

The so-called chemobiotic compounds have given variable response with cattle. Most of the midwest tests have not shown significant response while those in western states have been more favorable.

Sulfa drugs are often used in combination with antibiotics for hog feeding. They have given good response. The sulfas are used chiefly for specific disease prevention in cattle.

A child is born in the United States every 7½ seconds. There is a death every 20 seconds. An immigrant arrives in the United States on the average of every 1½ minutes, while a person leaves the country every 20 minutes. The result is a net population increase of one every 11 seconds.

Arsenicals are making a good record in hog rations. They have improved feed efficiency and rate of gain in most college tests. Again, there hasn't been much testing of arsenicals with cattle.

There are a few final reminders about the whole field of additives. First, they won't take the place of poor management or sanitation practices.

Also, they won't give huge gain or feed efficiency increases. Be suspicious of anyone that tries to sell you some feed additive that will double or triple rate of gain in hogs or cattle.

What's Behind The Push For Pellets?

Another step toward pushbutton feeding.

Condensed from Nation's Agriculture

Richard B. Hunt,
Doane Agricultural Service

"POWER-PACKED pellets return near miraculous livestock gains" — "farmers' feed storage problems will be all but solved" — "baled hay will soon become a thing of the past" — "pellets will revolutionize the feed industry."

During the past year, these and many other conclusions have been sounded all across the nation. But—how much stock can the practical-minded farmer place in these astonishing claims?

Pelleting has caused as much excitement among livestock and feed men as occurred when growth hormones were introduced on the market. While pellets have long been used in poultry feeds and protein supplements for hogs and cattle, attention has only recently been focused on their potential as complete rations for cattle, hogs and sheep and in connection with all-roughage rations. Some of the top animal scientists pioneering in the field of pelleting have said, "Our early work with pellets 4 or 5 years ago was so favorable that we could hardly believe our own test results!"

The truth of the matter is that these early tests have now been repeated dozens of times all across the nation. And, in many, results can be used to substantiate the amazing claims that have been hard for many farmers to swallow.

Pellets are being made into about every size and shape conceivable — and from practically every type of everyday livestock feeds. Now, the bun or wafer form is surging into prominence for all-hay rations. Pelleting, or its counterpart, wafering, is not known to appreciably alter the nutritional content of feed. However, it completely changes the physical form of feedstuffs—for the better. Grain, hay and the like are separately, or in combination, compressed and welded

Reprinted by permission from Nation's Agriculture, P.O. Box 267, Mount Morris, Illinois

into a high density pellet or wafer.

Several digestion trials indicate that pelleting or cubing does not materially change the digestibility of feeds for ruminants, either up or down. They have explained the increased gain received when a ration is pelleted rather than fed in conventional form—on the basis of a greater intake of total feed. Because pelleting increases the density of a ration, more of it can be consumed. This is extremely important with high roughage rations.

Quality hay would supply plenty of nutrients to wintering cattle if the critters could consume enough of this bulky feed. In dairy cattle, high production has been impossible from high ratio roughage rations—the cow just can't eat enough to be converted into those extra pounds of milk.

With this look into the nutritional side of the picture, we are able to understand much of the excitement about pelleting and wafering.

The key to greater use of low cost roughage is being able to get livestock to consume more of it! This is the major role that pelleting and wafering will play.

Livestock are unable to select and pick over a pelleted ration. More uniform gains and production can be obtained since each mouthful will be the same. Selection is eliminated because feeds are chopped and, in the case of pellets, ground before they are compressed. Coarse, undesirable portions of roughage such as stems and any less palatable grains mixed in a ration will all be consumed. Also, palatability is generally increased by pelleting.

Sixteen per cent of the gross freight revenue is from agricultural products.

The cost of feed storage, handling and transportation is greatly reduced when feeds are pelleted. This is mainly due to the reduction in bulk from pelleting.

A ton of hay pellets can be stored or transported in about 1/3 to 1/6 the space baled or long hay would require. Also, pellets or wafers can be handled with augers or conveyors in much the same way as shelled corn.

In the case of pelleted complete rations, storage requirements are cut to one bin instead of several. Farmers are quick to see the possibilities of slashing their labor bill by making the over-all job of livestock feeding just a whole lot easier!

Pellets and wafers are "ready-made" for automation or push button feeding. Also, the handling equipment and storage fa-

cility requirements are cut to a minimum. And these are the expensive investments which are usually out of reach of many farmers pocketbooks.

Complete pelleted rations for lambs dominated the earliest pellet feeding experiments. In college tests, lamb fattening gains were increased from 8 to 55% with 9 to 26% less feed consumed per pound of gain for pelleted feed over regular loose feed. This amounted to .10 to .15 pound additional daily gain from the pellets. Repeated feeding records show that lambs can save up to 100 pounds of feed in producing 100 pounds of gain when rations are pelleted. Where lambs have had a choice between pellets and regular loose feed, they preferred pellets 3 to 1.

About the best lamb ration mixture will be around 65% roughage (hay) to 35% concentrate (grain-protein meal), ground, mixed and pelleted. Remember that the pelleting process doesn't add feed value to the ingredients of a ration. You must start with a balanced ration. A poor mixture that was skimpy on protein can't be overcome just by pelleting.

Swine producers have been using pelleted protein supplements for years. They have found that pelleting prevents dust blowing, spillage and other waste and feed is often easier to handle. Gains have been quite satisfactory. As the good results using pelleted complete lamb rations become known, many have wondered if the entire hog ration couldn't be improved by pelleting.

The drawback has been that man in the past hasn't been able to make a complete mixed ration as well as the hog could himself if ingredients were fed free choice. Swine nutritionists have recently broken this barrier and have turned to the next step of pelleting the complete mixed meal ration.

Here are two important elements of success. First, take good aim. Two, know when to pull the trigger.

Results have been varied; however, it's safe to conclude that pellets will be just as satisfactory from a gain and feed efficiency standpoint as complete mixed meal rations under many conditions. But the added cost of pelleting will have to be justified from the savings incurred in storing and handling the feed.

The exception is where barley is the main feed grain used in the ration instead of corn. Pelleting barley rations has resulted in hogs making 12 to 14% faster gains, using 8 to 20% less feed per pound of gain. Daily gain increased .20 to .30 pound. The

time required on feed to reach market weight is cut by up to 30 days, and feed required to put on 100 pounds of gain can easily be cut 30 to 50 pounds under practical farm conditions.

Perhaps the most significant pelleting developments are being made with beef cattle. Many cattle rations are predominantly roughage, especially for wintering and growing stages. The astonishing results obtained by Bob Webb and his co-workers at the University of Illinois Dixon Springs Experiment Station have been repeated at several other stations.

You may recall that the Illinois tests reported in 1957 showed a remarkable 174% increase in gains from only 43% more feed during the 119-day winter feeding trial. This test ran 2 consecutive years; used an all-hay ration (1/3 alfalfa and 2/3 timothy) fed to yearling steers. The daily gains were increased from 62 to 1.73 pounds. This indicated the hay ration would supply the necessary nutrients for much improved gains if it could be provided in a dense, palatable form which could be eaten in enough volume by the steers.

During the summer of 1958, University of Georgia researchers fed all-hay pellets to yearling steers during a 100-day test. The lots which received pelleted Coastal Bermuda grass hay gained 2.07 pounds per day. Those fed alfalfa pellets gained 2.29 pounds per day. Earlier out on the West Coast, the University of California conducted a 167-day wintering steer test. One lot of steers received regular long alfalfa hay, the other, pelleted alfalfa hay. Those receiving pellets showed a daily gain of 2.17 pounds compared to 1.80 pounds, on 35 pounds less feed per 100 pounds gain.

Gasoline is generally the most economical tractor fuel when tractor operation does not exceed 400 to 500 hours a year.

Pelleted fattening rations for beef cattle should contain at least 25 to 35% roughage (hay) for best results. Since bulky roughage makes up a fairly small per cent of the ration, density and resulting increased consumption from pelleting will be less than the wintering rations discussed above. However, cattle gains have been upped as much as 8% with about 14% less feed required per pound of gain over typical 120 to 150-day full feeding programs by pelleting. Gains averaging around 3 pounds per day (without stilbestrol or other growth hormones) aren't out of reach of commercial feed lot operators.

Dairymen were puzzled when

initial tests showed that pelleted rations held production up, but caused a reduction in the butterfat produced. Study revealed that butter fat production comes from cellulose which is normally supplied to cows in the form of roughage such as hay or silage. When the hay is ground and pelleted, it is not retained in the rumen long enough for the cellulose to be thoroughly digested, and insufficient fatty acids are available for normal butterfat production.

This problem has been licked by incorporating longer cuts (½ inch about minimum) of hay in larger sized pellets, using a specially designed experimental pelleter. The wafer or hay bun, however, appears to be an answer to this problem also, for it can compress hay straight from the forage chopper which could be used to pick up sun-cured hay from field windrows (2- to 3-inch length hay cuts) without any problems. Also, moisture is not as critical as with standard pelleters in that 20 to 25% moisture content hay works out well. (Standard pellet mills should use materials dried down at least to 15 to 18% moisture.)

Another way to lick the dairy problem is to provide a small amount (about one bale per 20 to 30 cows) of long hay, fed free choice, along with the complete dairy ration pellets. This supplied enough long roughage in the diet to hold up butterfat production on a recently visited Los Angeles dairy farm.

Livestock producers have been quick to visualize the many advantages of using pelleted rations. Custom pelleting is increasing very rapidly. West Coast farmers and ranchers have been the first to convert to pelleted feed in volume. Out there, transportation of hay is a major problem. Also, average size of operation is somewhat larger than in other areas of the nation.

The cost of a pellet mill installation is the major roadblock for expanded farm ownership. Depending on the size, a pellet mill installation will cost from $10,000 to $30,000. Of course, many farms already own much of the grinding and handling equipment needed — in which case cost to convert to pelleting is cut substantially. Wafering machines now in use on the West Coast run around $35,000 to $40,000.

At present, custom pelleting charges are about $2 to $3 per ton for preground-mixed feed. For grinding, mixing and pelleting a complete ration, figure on $6 to $10 per ton. For an all-roughage ration from long hay, figure about $9 to $15 per ton. At these charges, many livestock men will be able to profitably

change to pelleted rations.

In the future, 3 major areas appear to offer the most potential for expanded use of pelleting. These are: (1) custom pelleting by local feed mills or portable pelleting units; (2) large commercial ranches, farms and feed lots, where the volume of pellets used will justify the large investment costs; and (3) in major hay producing regions where hay could be pelleted prior to shipping or hauling to an expanded market area because of the resulting lower transportation costs and a growing demand for pelleted hay for roughage rations.

The dream of a field pelleter which would actually m o v e across a hay field spitting out 4 to 8 tons per hour is what many hope will soon materialize. Leading equipment manufacturers are busy at work on such a machine now. Best estimates are that a field pelleter will be on the market in the next 3 to 5 years.

Oats Silage May Top Grain Yields

Dairymen whose oats fields show signs of low grain yields might be far ahead of the game, if they harvest the crop as silage and feed it in winter.

"Tonnage yields won't compare with those from Atlas sorgo and other standard silage crops, if planted strictly for silage," says R. B. Durham of Era, Cooke County, Tex. "But the silage may be worth more than a grain crop."

Like a growing number of dairymen, Durham put up his last year's oats crop as silage, and had good success with it. His 30 acres yielded only 120 tons—about half what could have been expected from standard silage crops. But he still figured it worth more as silage than as grain, with the expected low grain yields. Too, low prices for grain and a thin stand to begin with made it more profitable to ensile the crop.

Feeding value of oats silage proved to be good. Milk production from his milking strain of 37 cows held to a year-around 9,000-pound average per cow. "I've had to hay a little less this winter, too, and the cows don't scour quite as badly," he says.

However, spoilage has been greater in oats silage than in Atlas sorgo, which is normally planted on Durham's farm each year. But he figures spoilage in oats silage may have been caused by harvesting the crop too far past the dough stage for good keeping.

—Norris Jackson, The Farm and Ranch

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

A Louisiana farmer who had a reputation as a skinflint was visited by a Government inspector. "I hear you are violating the law by paying below the minimum wage," the inspector said.

"Oh, am I?" the farmer cried angrily. "Well, there's Willie who milks the cows and does the chores around the barn, ask him."

"Forty dollars a week, sir," Willie said.

"And there's Sammy," the farmer said, calling over the other hired man. "Tell this man your wages."

"Forty dollars a week, sir."

"And there's the maid, Katie, ask her."

"Thirty dollars a week with room and board, sir," Katie said.

"Any more?" the inspector asked.

"Well, no—only the half-wit," the farmer said. "He gets $10 a week, a bit of tobacco, and his food."

"Could I speak to him?" the inspector asked.

"Sure," the farmer answered, "you're speaking to him now!"

Mrs. James E. Burns
The Progressive Farmer

★ ★ ★

What this country needs is a special encyclopedia with blank pages for the guys who know everything.

★ ★ ★

An antique collector passing through a small village stopped to watch an old man chopping wood with an ancient ax. "That's a mighty old ax you have there," he remarked.

"Yup," said the villager, "it once belonged to Sir Walter Raleigh."

"Not really!" gasped the collector. "It has certainly stood up well."

"Of course," admitted the old man, "it's had three new handles and two new heads."

The Lion

★ ★ ★

These days a husband and wife either have to have minds that run in the same channel or else two television sets.

Ever hear about the farmer who bought a surrealist painting so modern he couldn't tell up from down. When asked "Why?" he said: "Best picture I've seen of the farm situation."

Grange Monthly

★ ★ ★

A farmer's wife had been badgering him for months to take some "youth" pills she had been reading about. Finally he relented one night before going to bed and took several from a box she had bought for him. The next morning his wife kept shaking him to get up.

"Get up," she stormed, "It's time you were out of bed."

"All right, all right," he said defiantly, squinting one eye open, "I'll get up. But I won't go to school."

Holstein-Friesian World

★ ★ ★

The list of prizewinners at a recent picnic was announced as follows:

"Mrs. Smith won the ladies' rolling pin throwing contest by hurling a pin 75 feet. Mr. Smith won the 100-yard dash."

Texas Farming

★ ★ ★

Pat was new at the job of working as a farm hand, and the first attempt was anything but successful.

"Look here!" said the farmer, "that kind of thing won't do. Corn that grows in a row as crooked as that will be dizzy. Fix your eyes on something across the field and plow straight toward it. That cow there by the gate is right opposite us. Aim at her, and you'll do pretty well."

"All right, sir," said Pat. Just then the farmer was called away to the barn. Fifteen minutes later he returned and was horrified to see that the plow had been wandering in a zigzag course all over the field.

"Hold on there!" he shouted. "Hold on! What are you up to?"

"And shure, sir," said Pat, "I did what you told me. I worked straight for the cow, but the crayture would not kape still."

Sunshine Magazine

★ ★ ★

A wife was determined to break her husband's habit of swearing, which he not only would do at considerable length, but with a passionate fervor. One day, hurting himself while chopping wood, he really let go. Determined to shame him his wife gritted her teeth and repeated everything he had said, word for word. The husband stared at her for a moment, then shaking his head critically, said:

"You've got the right words, honey, but no lilt."

Implement & Tractor

★ ★ ★

It isn't the hours you put in your work, but the work you put in your hours.

Ed Monahan, a prosperous dairy farmer, always maintained that his success was due to outsmarting the animals he raised on his farm. His theory was proved to a neighbor the other day when he rode into the barnyard and found Ed putting forkfuls of hay along the shed roof.

"What's the idea, Ed?" he called out as he climbed from the car.

"Oh, like I always say," Monahan began philosophically, "you have to be smarter than the animals."

"So?" his neighbor asked, a bit disgustedly.

"Well, as you know, I had a poor crop of hay this year. If I put it in the manger the cows won't eat it. But if I put it up here where they can just reach it, they think they're stealing it and they'll eat every bit."

Gladys Greene
American Agriculturist

★ ★ ★

One reason why a dog makes friends
And keeps them without fail.
He never, never wags his tongue
Instead he wags his tail.

★ ★ ★

"Those were awful hard to get on," the first grade teacher complained when she had finally managed to get the six-year-old's feet into his galoshes.

"That's because they ain't mine," he explained.

Patiently the teacher resumed the struggle and after much effort and time, pried the galoshes off again. Then in a mournful tone, the child said, "They're my brother's, but Mommy says I have to wear them."

Texas Future Farmer

★ ★ ★

A tourist stopped to talk with a backwoods farmer. "I see you raise hogs almost exclusively around here," he said. "Do they pay better than corn and potatoes?"

"Well, no," drawled the farmer, "but hogs don't need no hoein'."

Butter-Fat

★ ★ ★

Several farmers idling away a rainy day at the crossroads filling station got to arguing the merits of various church denominations. All expressed opinions except one old gray-beard who sat quietly whittling but listening attentively.

Finally, someone asked, "What do you think, Grandpa?"

"I'm thinkin'," replied the old man, "that there are three ways from here to the cotton gin. But when you get there, the ginner ain't goin' to ask which way you took. He's goin' to ask. 'How is your cotton'?"

Wall Street Journal

★ ★ ★

Old age has some benefits. For instance, you can whistle as you wash your teeth.

Enzymes, Newest Beef Gain-Boosters

Beef cattle get a feeding "kick" from these additives . . .

Condensed from Farm Journal

· *Dean C. Wolf*

A whole new family of cattle-feed additives may be hitting your feedlot one of these days. They're enzymes that speed gain and save feed by improving a steer's ability to digest starches and proteins.

Iowa State scientists reported results of the first tests at their annual Cattle Feeders Day in March of this year. They got an average of 12% *boost in gain and 7% saving in feed* from a combination of enzymes in a product called Agrozyme.

The Iowans got consistent results in three tests—one with heifer and steer calves fed 168 days and two others with yearling steers fed 175 days. And the enzyme "kick" comes *on top of what you get from stilbestrol.* All of the cattle were fed a high-corn finishing ration with a supplement containing stilbestrol.

Test lots got the same ration plus .0075 lb. of Agrozyme per head daily.

They gained 2.57 lbs. per day compared with 2.31 for the controls—good gains for long-feds. It took 879 lbs. of feed to make 100 lbs. of gain with the enzymes; 943 without them.

Carcass grades were about the same—high good, with a slight edge for some of the cattle getting the enzymes. But the *test cattle returned $8.05 more per head* than the controls, after deducting cost of feed including the Agrozyme.

"That's about the same improvement that we got in the early tests with stilbestrol," scientist Wise Burroughs said.

These results with cattle are something of a surprise, since in poultry tests the enzymes improve barley rations but not corn. Agrozyme is now being used to supplement barley rations for poultry and it's now available to feed manufacturers for tests with cattle. The company making it expects it to be in use by cattle feeders soon.

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

The enzyme premix costs $1.80 per pound in quantity. The Iowa Staters added 15 lbs. ($27 worth) to a ton of supplement, which they fed at the rate of 1 lb. per head daily. That figures at less than 1½ cents per head daily, but they got back $4.28 for every $1 they spent for Agrozyme.

The U. S. ranks 15th among countries of the world in per capita consumption of dairy products. Ireland, New Zealand and Finland lead in consumption of all dairy products. The Swiss eat the most cheese.

Some of the gain boost comes from a 4% increase in feed consumption, but the improvement in efficiency is a result of the enzymes helping break down starches and proteins in the feed. At least that's the theory, since Agrozyme, made by a fermentation process, contains both starch-splitting and protein-digesting enzymes—possibly others. Normally, enzymes produced by bacteria in the rumen digest the feed that cattle eat. Feeding extra enzymes apparently gives those already in the rumen an assist.

The Iowans got their "kick" from enzymes fed with dry corn —14% moisture or less which is safe for bin storage. They *got little or no boost from Agrozyme in three trials with high-moisture corn,* which tested 19% moisture in an ordinary crib and 30% in a Harvestore silo.

"This may be a clue to why we get an 8% improvement in feed efficiency by feeding wet corn," says Burroughs. "But we're not sure if enzymes developed by fermentation in the silo are doing it or whether it's just easier for enzymes in the rumen to digest corn when it's soft."

You'll be hearing more about Agrozyme. Iowa State has three tests underway to see if it'll work with high roughage rations. Early indications are that it has little or no effect on roughage. Other experiment stations have tests under way with sorghum and barley. Scientists are also testing Agrozyme with sheep and hogs.

Other enzyme products for beef may be in the picture, too. Four companies are already marketing enzymes for poultry feeds. All are naturally interested in the beef development.

Other news that came from the Iowa Cattle Feeders Day:

Tapazole, the new beef additive continues to look good.

It added 10 to 12 lbs. of gain per steer and cut feed requirements 12% when fed *during the last 5 weeks* of either a 120-day or 215-day feeding period. In previous tests, Tapazole boosted

gain 20 to 25 lbs. during the first 4 to 8 weeks of the feeding period. Illinois scientists got 13 lbs. more gain per steer in a 68-day trial.

Burroughs, who ran the first tests, sees the most promise for Tapazole fed at the level of 600 milligrams per head daily for around 60 days *at the end of the feeding period*. He figures you would get back around $3 for each $1 worth of Tapazole, if it were priced at 4 cents per gram, costing 2.4 cents per head daily.

"It may pay to feed it all the way, if it were cheaper," says Burroughs. "Tapazole improves carcasses about a tenth of a grade when fed from start to finish, but not when fed for a short time at the beginning or end which is where we get the big gain boost and feed saving."

This product isn't being marketed yet and it hasn't been approved for use in cattle feeds to date but the residue tests are encouraging.

Pelleting a finishing ration improved feed efficiency 8% but didn't affect gains in two tests with yearling steers on a 175-day feed. The 20 pounds of feed saved per 100 lbs. of gain wasn't enough to pay for the added cost figured at $7 per ton for grinding, mixing, pelleting and handling.

Feed cost came to 19.9 cents per pound of gain for the cattle on pellets; 16.6 cents for the controls getting ground ear corn, 3 lbs. of hay and a pound of supplement per steer daily. Margins above feed costs per steer were $22.30 for the controls and $8.50 for the pellet-fed. No labor charges are included.

The Iowans used ground corn cobs or oat hulls and dehydrated alfalfa meal in place of hay in the pellet to reduce grinding and pelleting costs. A ton of pellets included 1,362 lbs. ground ear corn, 250 lbs. corncobs or oat hulls, 100 lbs. dehydrated alfalfa meal, 100 lbs. soybean meal, urea, salt, minerals, trace minerals and stilbestrol.

Make Layers Eat More

With low egg prices, egg production must be high to maintain income and hens must eat heavily to produce, says Julian Moore, Florida Agricultural Extension Service. If using automatic feeders, he advises, run them a little more frequently. If using hand-filled hoppers, stir the mash a few times daily. These practices attract the layers and they eat more.

—*Florida Agricultural Extension*

Ton Of Beef Per Acre From Grass

It has been done at southern experiment stations. Who'll be the first farmer to make it?

Condensed from
The Progressive Farmer

Joe Elliott

SAVE a place for beef cattle in meatmaking headlines.

Broilers and pigs have had their day, and may again, but the big news now belongs to beef. And it is being done with grass, cheapest of all animal feeds to come by. We're not sure whether the big story is beef or grass. Correctly, it's both, for as the song says, "You can't have one without the other."

Say to a practical cattleman: "You will one day be making a ton of beef to the acre from grass," and the chances are you'll get the loud whistle and "aw, you're kidding!" t r e a t m e n t. Worse still, you may get a fishy stare implying you're "off your rocker." Well, it not only has been done, it has been exceeded!

Steers Made It on Coastal Pellets

Let's look at some facts. Steers were fed on the Southeast Georgia Branch Experiment Station, Midville. Some got Coastal Bermuda grass only, in pellets. Others had a ration of 50% Coastal Bermuda pellets, 50% ground shelled corn and CSM (mixed 7 to 1 and fed loose). Supt. Orien Brooks reports that 8.05 tons of Coastal Bermuda fed as hard pellets in a test completed last fall gave beef gains of 2,070 pounds. Pellets were fed to 10 steers weighing an average of 550 pounds at the start for 100 days. Average daily gain was 2.13 pounds. S t e e r s put on 100 p o u n d s gain from each 756 pounds pellets eaten.

A second experiment was run during the winter. In this one, when fed pellets only, 10 steers similar to those in the earlier tests converted 9.46 tons into 2,557 pounds of beef. A group of like steers fed on a conventional ration of ground snapped corn, CSM, and long Bermuda hay ate 10.5 tons corn and put on 2,611 pounds of weight. The way Mr. Brooks figures it, corn would have to yield over 200 bushels to the acre to equal Coastal pellets, and CSM and hay would have to be supplied

Reprinted by permission from The Progressive Farmer, 821 N. 19th St., Birmingham 2, Alabama

in addition.

Florida Tests Set the Stage

First reports of a ton of beef per acre from grass came out of Florida, from the Everglades Experiment Station, Belle Glade, some years ago. There they had everything in their favor — 12 months' grazing, abundant rainfall, deep muck soils. Their reports of over 2,000 pounds of beef gains per acre of St. Augustine grass in a 12 months' period knocked fellow researchers back on their heels. To clinch the point, work was continued for five years with average annual beef gains of 1,802 pounds to the acre. In two of the five years, gains went above a ton.

Calves were turned on at an average weight of 548.7 pounds. Stocking rates were a little better than three head to the acre. Rotational grazing (switching from one pasture plot to another) was practiced. But there was a slight "joker" in their test. Minor elements known to be needed by cattle were lacking in soils of the Everglades. As a safety measure, 1 pound of cottonseed meal or pellets was fed per head daily to supply needed minerals. Some eyebrows were raised over this. After trials were over, Dr. Ralph W. Kidder of the Florida station admitted: "Total effect of the meal may have been more than its nutrient content would indicate."

Winter Grasses on Summer Sod

What about areas where no one grass furnishes 12 months' grazing? Putting two or more together seems a logical answer. There are some clues as to what might be expected. Dr. Glenn Burton, pasture expert at Georgia Coastal Plain Experiment Station who developed Coastal Bermuda grass has called attention to this possibility.

Here's the way Dr. Burton builds up his case: High rates of nitrogen fertilizer (800 pounds N to the acre) balanced with other plant foods on Coastal Bermuda turn out enough forage to make over 1,000 pounds of beef. Add irrigation when needed, and expected growth could be hiked up enough to make 1,500 pounds of beef. Follow rotational grazing (or cut and make into pellets) to avoid damage to growth from heavy cattle population, and you might push acre beef yields up to 2,250 pounds. All this would come from seven months' growing season of Coastal Bermuda.

Less than 200 miles from Tifton, Ga., where Dr. Burton works, at Alabama Experiment Station, Auburn, Ala., a mixture of ryegrass and crimson clover was seeded on Coastal Bermuda sod. Beef gains during fall and winter months amounted to 430

pounds to the acre. Add Dr. Burton's speculative beef gains at Tifton from Coastal Bermuda and actual gains from ryegrass and crimson on Coastal sod at Auburn, and you get 2,680 pounds as something to shoot at. Before you laugh, look back at results from Midville, Ga., station. There they actually got 2,557 pounds of beef from Coastal Bermuda pellets coming off an acre.

The cheetah, the world's fastest runner, has been clocked at 81 mph.

We put this question of how high we could go in beef gains from grass to Dr. E. J. Warwick, chief of Beef Cattle Research Branch, USDA. Admitting there were a lot of complicating factors (size and condition of cattle at outset, stocking rates, weighing conditions, etc.) he did get down to some broad rules of thumb. Here's the gist of his thinking:

First off. he reasoned the best way to get the most from forage would be to harvest and bring to animals for drylot feeding. To graze it off, you would have so many animals on the land they would trample and foul grass to an extent it would not be palatable. Next, he assumed 500- to 550- pound steers should put on a pound of gain from 5 to 6 pounds of TDN (total digestible nutrients). He then recalled the highest forage yield to come to his attention was 12 tons of Coastal Bermuda grass hay from high rates of fertilization. If the Coastal Bermuda hay averaged 55% TDN and animals gained a pound for each 5 to 6 pounds TDN, this could lead to per-acre gains of around 2,600 pounds of beef, he figured.

We have had another field report which totals up with the above figures, too, Dr. William Longstaff, Texas Research Foundation, working on the A. P. Fowler farm, Van Zandt County, Tex., was able to get 11.39 tons of Coastal Bermuda grass hay per acre. Charlie Scruggs reported in our March Texas Edition that Coastal Bermuda hay on the Fowler farm averaged 13.3% protein. Yields, he said, were a third or more higher than the best alfalfa yields with irrigation. The field was fertilized with 500 pounds per acre of 16-20-0 plus 75 pounds potash (K_2O). One hundred pounds

The average man spends about two months of his life shaving.

of nitrogen topdressing was put on after each of the first four cuttings. Hay was cut five times.

Dr. Burton, talking to a grassland farming group, once said, "the sky is the limit in forage production." We are ready to believe him. There is a lot of "head room" yet in what can be done.

It's hard to raise a family, especially in the morning.

We must be realistic, though. It may be quite a few years yet before we talk of a ton of beef to the acre with the same familiarity of 100-bushel corn yields, or 2 bales of cotton, or a ton of tobacco. But we firmly believe it's coming. Let's recount a few of our advantages pointing in this direction:

Some Points in Our Favor

1. New high-yielding, highly nutritious grasses have been developed — notably Coastal Bermuda in Coastal and Mid-South areas — its close kin Midland Bermuda for areas where winters are more severe.

2. We have a new wealth of "know-how" about grassland fertilization and management. Rates of nitrogen unheard of a few years ago, for example, are leading to amazing yields and levels of protein content.

3. We have not yet fully capitalized on our long grass-growing season and favorable rainfall conditions. But the weather is too unpredictable to base high stocking rates on it. Supplemental irrigation must be kept in

Fertilizer can be either acid or neutral.

stand-by order, if we are to realize the most from our grasses.

4. Some revolutionary changes are on the way in forage and hay harvesting methods. We used to say: "Let the cows go out and get it." Now we are beginning to suspect it may pay well for the effort to bring it to them. Chopped forage (zero grazing), hay pelleting, hay wafering, and grass silage are gaining favor. Certainly animals can be kept more comfortable in shaded feedlots, and parasites and diseases are easier to control.

5. Performance testing and similar programs hold vast possibilities for finding superior

A stubborn man doesn't hold opinions. They hold him.

gaining animals. A constant search is on for cattle better adapted to our Southern grass-growing economy. Favorable results are already evident. We will no doubt see more far-reaching developments.

What About "Contract Milking"?

"Cow pools" springing up in the Midwest are struggling through the "growing pains" stage . .

Condensed from Successful Farming

James R. Borcherding

OUT of the dozens of contract milking arrangements being talked about or proposed in the Midwest, many are falling by the wayside before they emerge from the idea or "blueprint" stage.

But some are starting operation — enough to cause enthusiasm on the part of some of you, deep concern and disgust on the part of others, and a good deal of thinking by key dairy leaders.

Here are ideas and opinions to help you determine how "contract milking" might affect *you*.

What Is It?

Contract milking can take several forms. With the first kind we'll consider (originally developed in Utah), herds of cows from a number of local farms are brought to a central location. Here they're housed, fed, and milked. Usually cows from each herd are kept in a separate lot, with much of the feeding and care done in herd units.

Herd owners as a group usually finance the central milking unit. Lots, housing, and feeding facilities may be financed or built by the individual herd owner, or on a co-operative basis. Usually several highly capable men are hired to handle the milking and to manage and coordinate the operation. Herd owners living near by may take care of feeding and manure removal themselves.

The second main type of contract milking becomes somewhat of a "milk factory." Land, housing, and equipment are owned by a single operator or several individuals with the unit a business venture.

Owners of the cows enter into a contract in which they pay a flat rate per cow for use of buildings and equipment. Other expenses are pro-rated according to number of cows entered. The contractor or "cow pool" owner obtains a market outlet for the milk, buys all feed and bedding, arranges for veterinary service and breeding the cow. The herd owner takes no direct part in the

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

operation of the unit—he gives up most "decision making."

Expenses are figured each month. Those other than feed and breeding are pro-rated for all cows in the pool. Testing association records are the basis for feed and production estimates. Herd owners receive monthly statements showing income, expenses, and net return for each cow they have in the pool. (There may be a charge rather than a return if production level is low.) A certain per cent of the net return is deducted for "management" (usually about 5%) and herd owners receive a monthly check for the balance. Breeding fees are paid by the herd owner—he can suggest the use of certain bulls available artificially.

Cows can be removed by the owner when they taper off in production and replaced with other higher producing cows as long as the total number is the same as contracted for. Sick cows that don't respond to treatment must be taken home by the owner or sent home at his expense. Dry cows and calves might be taken back to the herd owner's farm or arrangements made to handle them near by.

The first "contract milking" unit of this kind was started by Carroll **Morris** at Meservey, Iowa, in the fall of 1958.

The third type of contract milking operation again involves the "milk factory" type unit. It is similar to the one we've just discussed, but is organized as a corporation, may have financial backing by business interests, is likely to be a somewhat more glamorous, elaborate setup. Or, it may be sponsored by a commercial company. (A corporation unit financed by farmers is being developed in Ohio.) Most proposed contract milking units fit these 3 types of contract arrangements.

Many of our difficulties come from feeling when we should think, and thinking when we should feel.

Who's Using It and Why?

Who is participating in contract milking or cow pools? Quite a wide cross-section of individuals, it appears. *Greatest attraction seems to be among dairymen with relatively small-size herds.* They're taking this opportunity to change from a manufacturing milk market to a more favorable Grade A outlet.

Contract milking appears to offer them a chance to make the switchover without the customary outlay of capital for improved facilities and equipment. Also without the need to learn management techniques necessary for producing a high-quality pro-

duct. Included, too, are older farmers who want to cut down on their work load, yet stay on the farm. Should the quantity of Grade A milk increase too fast, the blend price of Grade A would drop and attraction on the part of this group might decrease.

Dairymen with relatively good-size herds or highly efficient smaller herds in family-type dairy operations are finding much less attraction in the new idea. They have most of the benefits a contract milking arrangement could offer—plus, a switchover might mean decreased herd production. They might also be left with housing, equipment, and labor which couldn't be used too effectively in other ways; or, without the finances to shift into other alternative livestock or cropping programs.

When a new idea like contract milking pops up, there are always some investors from business other than farming who want to be part of the development. They may want to invest in cows or a portion of the physical facilities. By studying contract milking on "paper" and applying the principles used in other business ventures, the idea looks good. Of those who've been involved in cow pools, some have reportedly been pleased with their investment, others discouraged and very disillusioned by the results.

Advantages and Disadvantages

Some definite advantages can be pointed out for the first type of contract milking arrangements we discussed—the one cooperatively owned and operated and kept on a local basis. It lets small or medium-size herd owners produce a higher-quality product than with facilities they had at home. They can secure a favorable market outlet, probably increase their net income.

An endless number of advantages and disadvantages can be pointed out for the somewhat larger contract milking operations. Any decision to take part would depend on your individual dairy operation and what you think might be gained by making the change.

There is an element of risk to be considered when management of your herd is shifted to other people. To point up the importance of management, Dr. E. E. Heizer, University of Wisconsin, stressed in a recent talk that 70% of a dairy cow's production is due to the feeding and management she gets. Genetics is now responsible for only 30% of production.

Success of any contract arrangement you might enter into depends greatly on the terms of the contract, integrity and management ability of the contractor.

Also, his housing facilities and equipment, plus the assured market outlet for milk.

If You Want to Try It

If you're thinking of "boarding your cows out," there are lots of questions to consider. Better visit the proposed cow pool, also visit with a number of other farmers who already have cows under contract at the unit. In new units, with no experience, decisions can only be based on what you *think* the operation might be like.

Out of the total egg production in the United States, 5 per cent of the eggs are used for hatching, one per cent exported, one per cent dried, 4 per cent merchandised as liquid eggs, and the remaining 89 per cent are sold retail in the shell form. —Poultry Tribune.

Here are key factors Iowa State College Extension specialists think you should consider:

- Will your cows produce more or less than they would at home?
- How much increase in price of milk can you expect?
- Will this increase be permanent?
- Will the income from the sale of milk pay expenses and still return a profit on your investment?
- Will the length of a cow's usefulness be changed under "contract milking"?
- Will there likely be an increase in the incidence of disease?
- What are the health requirements for entrance of cows into the pool?
- Will your cows be mixed with others or kept in a herd unit?
- Are adequate veterinarian services available?

The average consumption per person of fluid milk and cream dropped from 349 pounds in 1957 to 345 pounds in 1958.

- Will there be personal observation of each cow to detect sickness and heat periods?
- Will planned milking practices likely control the spread of mastitis?
- How will your dry cows be cared for?
- What about calf raising?
- And the cost of these?
- How will the breeding program in your herd be affected?
- Will there be a savings in prices of expense items such as feed and bedding, veterinary bills, production testing, and breeding fees?
- What will be the reduction in hours of labor per cow, in buildings and equipment costs per cow?
- Once cows are away from your farm and in the pool arrangement, what changes will need to be made on your farm?

- Can good use be made of the time and labor saved?
- How will you use housing and equipment still on hand?
- Are there alternative ways of using roughage once consumed by the herd?
- How might your crop rotation need to be changed?
- How well do you like caring for a dairy herd and milking them on your own farm?

After weighing answers to these questions, decisions you make will likely be sound.

In recent years, the amount of money spent for food by each person in the U. S. has not increased as much as income after taxes.

What About the Future?

Because of the newness of contract milking operations, there are countless unanswered questions. *In the immediate future, there'll likely be little effect on well-operated family-type dairy farms geared for high, efficient production at the present time.*

Some are pondering the long-time effect. Were a large number of units to be successful, they might dominate key market outlets — and possibly put the "squeeze" on small dairymen. With a shift in marketing a few local milk plants and creameries are already feeling the effect on their operations.

Research shows that a farmer reasonably may expect at least 25 per cent more red clover hay if spittlebug is controlled.

Another question — how many cows in cow pool arrangements are "additional cows," those that might not be in production otherwise? To what extent will business interests be competing with dairy farmers? Could an increase in total production add to the overproduction problem?

Time and experience with existing units will determine total impact on dairying.

The dodo was a bird about the size of a turkey, with a big head, a long, hooked bill, and thick, short legs. It could not fly. Portuguese sailors discovered it in 1507 on an island near Africa. Some of these birds were brought to England, but there haven't been any for 200 years. People ate them, and, since they could not fly, pigs also caught and ate them. Soon they became extinct.

The expression "dead as a dodo" comes from the fact that these birds are not around any more. —*The Dakota Farmer*

NEW VETERINARY INSTRUCTION SERVICE

The article below is one chapter of a new Veterinary Instruction Manual soon to be published by Farmer's Digest. An entirely new idea in veterinary help for stockmen, this new service will show and tell by easily understood instructions and step-by-step illustrations how to grow healthy livestock, prevent heavy losses, and do many simple veterinary jobs yourself. Designed to be used every day as an essential tool, it will help you detect diseases in the early stages and call your veterinarian before it is too late to avoid heavy losses.

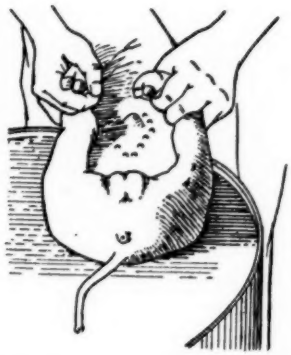
During the following months, complete contents of this new book to sell at $7.00 will appear in your regular issues of Farmer's Digest.

How to Castrate Pigs

Castrating pigs can be done by the farmer himself if these proven methods are followed carefully.

For best results and less setback, castration should always be performed when pigs are from 2 to 4 weeks of age, preferably at 2 weeks.

There are two common methods used in castrating swine. Use the one that suits you best.



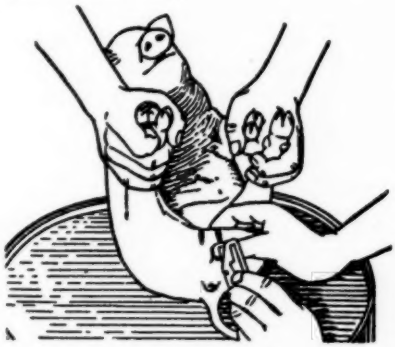
Method 1:

STEP 1. Helper holds pig, belly up, and with hind legs pulled forward and pressed into belly (see cut).

STEP 2. Clean and disinfect scrotum and surrounding area with a good disinfecting material. This is important.

STEP 3. Massage one testicle into the bottom part of the scrotal sac and grasp firmly between the forefinger and thumb, stretching the skin tight at the point of incision about ¾" off the midline.

STEP 4. Make an incision with a single bold stroke through the skin and into the meaty part of the testicle (the incision should be 1½" to 2" long and located at the lower end of the scrotal sac to allow adequate drainage) (see lower cut).



STEP 5. Force the testicle through the incision by applying pressure with the thumb and forefinger. The membrane attached to the end of the testicle can be severed with the castrating instrument.

STEP 6. Make the cord tight by pulling on the testicle. This will allow the whitish membranes to return to the scrotal sac. The sperm cord can then be pulled out with a quick jerk or by scraping in two with a knife edge.

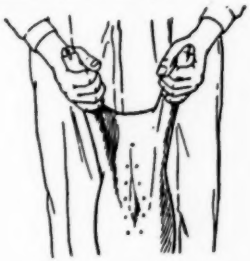
STEP 7. Repeat this same procedure through a second incision made in the same manner over the other testicle.

STEP 8. During fly season apply a fly repellent to the skin surface around the incision. Don't be in such a hurry as to avoid this step.

STEP 9. Keep the pigs in dry clean quarters for 24 to 48 hours. Never allow freshly castrated pigs into water holes, wallows, or other places with excess moisture.

Method 2:

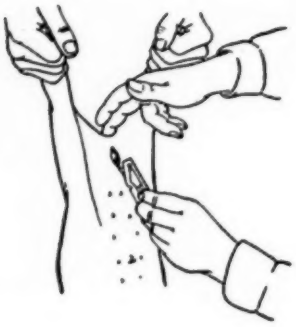
STEP 1. Helper holds pig by the rear legs, head down and belly out (see cut).



STEP 2. Cleanse and disinfect the area between the hind legs with a good disinfectant material. This is important.

STEP 3. Locate and massage both testicles toward the pig's head until they are in position between the rear legs.

STEP 4. While continuing to apply downward pressure, make an incision directly over and into the testicle at least 1½" to 2¼" in length to allow easy removal and proper drainage (see cut).



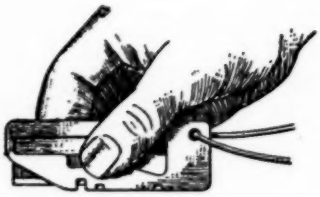
STEP 5. By applying pressure between the thumb and forefinger force the testicle through the incision.

STEP 6. Holding the cord taut slip the membranes back into the cavity and sever the cord as near the body as possible.

STEP 7. Repeat the same procedure through a second incision over the other testicle.

STEP 8. During fly season, apply a fly repellent to the skin surface around the incision. Do not avoid this step.

STEP 9. Keep the pigs in dry clean quarters for 24 to 48 hours. Never allow freshly castrated pigs into water holes, wallows, or other places with excess moisture.



Castrating Equipment

Your choice of a castrating knife is important. It must be sharp to do a fast and sanitary, but safe job. The old fashioned castrating knife is no longer popular for castrating small pigs. Many farmers accept a known hazard and use an open razor blade. Others use an expensive scalpel. Most satisfactory instrument for farm use, we believe, is the razor blade knife illustrated above. It uses a sharp, but easily replaced and low cost razor blade. The protected blade slides in and out to limit depth of cut. As an extra convenience, it can hang from a string around the user's neck to free both hands to help catch and hold pigs.

Several good disinfecting powders and liquid solutions suitable for use on castration wounds are now available commercially. One recommended, low cost powder is a combination of sulfa and urea powder. It is quickly sprayed or puffed on from a plastic, squeeze bottle without touching the wound.

Rearing Orphan Animals

An Australian veterinarian writes about a common farm problem . . .

Condensed from
Journal of Agriculture of Western Australia

F. C. Wilkinson, Veterinary Surgeon

THE rearing of orphan young is commonly carried out on farms, either from choice or as a necessity when mothers have died or for some reason are unable to supply milk for the offspring.

Two methods of rearing orphans are available:—

1. Adoption by a foster-mother, and
2. Artificial rearing by hand-feeding.

It is well known that the young of any species thrives best on milk of its own kind. Therefore, having the orphan adopted by another mother of the same species which has just borne young is undoubtedly the best arrangement. This, however, is not always practicable as a foster-mother is not usually available, and if available, sometimes refuses to adopt the orphan even after using all known methods of persuasion. In these cases, artificial rearing by hand-feeding should be adopted. If the general principles described in this article are carried out, then perfectly healthy normal animals can be raised.

Adoption By a Foster-Mother

Providing an animal which has just borne young is available, adoption is usually fairly easy. In raising calves a foster-mother —usually one that is no longer a useful milker—is commonly used to raise one, two, three or even four calves from other cows. These foster-mothers do not usually object to a new-born calf being placed with them. Sometimes, however, it is necessary to make the young smell like the foster dam's offspring. This is best done by rubbing the cow's afterbirth, if available, over the orphan. This method is also helpful to persuade recently-farrowed sows to adopt young piglets.

However, in sows, often no afterbirth is available, and in this

Reprinted by permission from The Journal of Agriculture of Western Australia, Department of Agriculture, Perth, Australia

case the best method is to sprinkle the sow, her own offspring and the orphans with a material having a strong odor such as disinfectant fluid. The sow should be removed for about 20 minutes, while the orphans and her own litter are allowed to mix, then allowed to return to the pen in which her litter and the orphans are running together.

In the older countries where shepherds tend the lambing ewes much more carefully, ewes which give birth to dead lambs are often persuaded to adopt orphan lambs by draping the dead lamb's skin over the orphan until it has been "mothered." Restraining the ewe until the adopted lamb has sucked is often effective, or the ewe's muzzle and the lamb to be adopted may be lightly smeared with some strong-smelling substance such as tar or even kerosene.

Newly-whelped bitches will often adopt another animal's puppies without any special encouragement.

Artificial Rearing

The problem is more difficult when a foster-mother is not available, but all domestic animals, as with human babies, can be raised with proper care and attention by nursing and artificial feeding. In cattle of course, it is commonplace to rear the calves artificially. As long as the calf is allowed the first milk (colostrum) and then fed regularly with the correct amounts of cow's milk, little difficulty is usually encountered. With most other farm animals only cow's milk is usually available and as the composition of milk from the various farm animals differs quite considerably, cow's milk often has to be altered before being fed.

Variations in Milk Composition

Composition of Milk (Per Cent) in Various Animals

	Water	Fat	Protein	Sugar
Cow	86.2	4.4*	3.8	4.9
Ewe	83.9	5.2	5.4	4.3
Goat	87.1	4.1	3.7	4.2
Sow	83.0	7.0	6.0	4.0
Dog	79.0	8.5	7.5	3.7
Horse	89.0	1.6	2.7	6.1
Human	87.4	3.8	1.6	7.0

* Average figure only. Varies from about 3 per cent to 6 per cent.

From the table it can be seen that the milk of the ewe, the doe, and the cow are nearly similar in composition and thus cow's milk can be used unchanged for raising lambs and goat kids. The milk of the sow is much richer in fat than that of an average cow, but pigs can be raised successfully on cow's milk which is rich in fat. Orphan piglets are very difficult to rear on skimmilk.

Mare's milk is lower in fat and higher in sugar than cow's milk, but is quite similar to human milk. Foals, therefore, can be raised on cow's milk which is low in butterfat, and to which sugar has been added or formu-

las for human babies can be used. The baby mixtures are expensive, but usually better than cow's milk which can cause a chronic diarrhea if fed before the foal is three months of age. If cow's milk is used, the mixture should be one pint of low-percentage-fat milk, one-quarter of a pint of lime water and a teaspoonful of sugar or glucodin. At two to three months of age, a change to skimmilk with sugar can be gradually made.

Puppies and kittens can be raised on cow's milk or formulas for human babies.

Should whole milk not be available, re-constituted dried buttermilk is an ideal substitute. As it has a high butter-fat content, it should not be used for foals. If one pound of dried buttermilk is mixed with one gallon of water, the resultant fluid differs very little from whole milk.

The Value of Colostrum

The value of the first milk commonly called colostrum or "beastings" cannot be stressed too much. Colostrum differs from normal milk in that it is a thicker, more viscous, fluid and is yellow in color. The main attributes of colostrum which make it preferable for new-born animals for the first few days of life are that it is:—

1. *A Rich Source of Vitamin A.*—It contains 10 to 100 times as much Vitamin A as normal milk. Colostrum provides enough Vitamin A so that sufficient can be stored in the liver to provide for maximum growth until the young can obtain Vitamin A from other feed sources.

Farming is sometimes known as a harrowing experience.

2. *A Rich Source of Protein.*—The protein mainly occurs in a form called globulin, which can be freely absorbed by the new-born, whereas other proteins cannot.

3. *A Supplier of Antibiotics.*—These are protective substances from the mother which help protect the new-born young against bacterial diseases until such time as it is old enough and strong enough to overcome disease organisms to which it is subjected.

An orphan which has had colostrum during the first 24 to 48 hours of its life is always much easier to rear than one which has never had any colostrum.

Methods of Feeding

All animals can be bottle-fed early in life by using calf, lamb, human or doll nipples. At a very early age most animals except lambs and foals can be taught to drink milk from a shallow pan or bucket. Calves can be taught to drink in the first few days of life, while with a little patience, even the youngest of piglets can

be taught to drink from a shallow dish. The piglet's mouth and nose should be pushed into the milk, care being taken not to suffocate the animal or to cause fluid to pass down the windpipe to the lungs. Puppies and kittens can be taught to drink at one to two weeks of age by a similar method.

It is essential that the milk be fresh and warmed to body heat (about 100° F.). Milk not drunk almost immediately should be removed and the implement of feeding sterilized with boiling water before the next feeding.

Quantities to Feed and Frequency of Feeding

A reliable standard for the quantity of milk to feed daily to young animals is a volume equal in weight to ten per cent of the body weight of the animals to be fed. For example, a 150 lb. foal would require 15 lb. of milk per day. As one gallon of milk weighs approximately 10 lbs., it would mean the foal would require 1½ gallons of milk per day. A young foal should be fed six times a day so it means giving two pints at each feeding.

Judging the amount to feed smaller animals is more difficult. For new-born lambs, three to four tablespoons every four hours is ideal. For piglets and puppies, it is only a matter of one to two teaspoonsful at each feeding. It should be stressed here that *it is hard to starve a young animal, but it is easy to overfeed it.*

The new-born animal should be fed every three hours for the first week of life and about every six hours thereafter. This of course is quite time-consuming, and is difficult to carry out for the whole 24 hours of the day. It should, however, be kept in mind that little, and often at regular intervals is the ideal.

Supplementary Solid Food and Weaning

The orphan animal should be encouraged to eat solid food as early as possible so that the amount and frequency of milk feeding can be reduced. With grazing animals and pigs, a mixture of crushed wheat (or oats) and dried buttermilk makes an excellent feed. Bran and skim-milk powder can also be added to make an easily digested supplement to the milk.

Suggested mixtures are:—

	lb.
1. Crushed grain	80
Dried Buttermilk Powder or Dried Skim Milk Powder	20
Salt	½
Bonemeal or bone flour	1
2. Crushed grain	60
Bran	20
Dried Buttermilk Powder or Dried Skim Milk Powder	20

Salt	½
Bonemeal or bone flour	1

Pigs will begin eating such a meal at about two weeks of age, especially if a little sugar is added at first. The meal should be made readily available to calves, foals, lambs and kids at about three weeks of age. As they gradually eat more meal, they can be weaned off milk completely. Piglets can be completely weaned on to special meals at one week of age, but on meals suggested they should be fed some milk until they are three to four weeks of age. The weaning of calves, lambs and kids depends on the availability of milk and willingness of the owner to devote time to feeding the orphans. They should be kept on some milk till at least they are four to six weeks old. Foals should not be weaned completely off milk until they are five to six months old if ideal growth is to be obtained.

Good quality hay or young short pasture should be available to all grazing animals during the weaning period, while with all animals it is essential to have readily accessible, cool drinking water always available.

Puppies and kittens should be started with minced, raw or cooked meat when about three weeks of age. As they gradually eat more meat, they can be weaned off milk completely at six weeks of age.

The important consideration during weaning is that *all changes should be made slowly,* gradually decreasing the amount of milk given as the intake of solid food increases.

Complications of Artificial Rearing

In general, for the first one or two months of life, the orphan young on an artificial diet will not appear as well-nourished as animals which are reared naturally on their mothers. They may have digestive upsets resulting in diarrhea and can contract pneumonia very easily if not housed in warm shelters out of the wind and rain.

Diarrhea

This is usually caused by overfeeding, feeding liquids at incorrect temperatures or feeding from contaminated feeding utensils.

If symptoms of diarrhea develop, the amount of milk should be reduced markedly for 24 to 48 hours. Small quantities of boiled water or lime water should be given in which a drug such as Sulpha G, Terramycin, Animal Formula Powder, or Aureomycin Soluble Powder has been added to overcome any infection. The milk being fed previously should gradually replace the lime water until the animal is back on a normal feeding level.

The addition of vitamins, especially Vitamin A and Vitamin D,

also often helps overcome the diarrhea.

Pneumonia

This is usually caused by fluids "going the wrong way" into the lungs or by the young being exposed to cold, wet conditions, allowing bacteria to cause an infection of the lungs.

The affected animal becomes dejected, will not drink or eat, breathes heavily, commonly coughs and has a nasal discharge.

Treatment consists of mainly good nursing. Keep the animal warm and try to tempt it to drink fluids. To overcome the infection, injections of sodium sulphamethazine 33-1/3 per cent solution should be given subcutaneously (under the skin). The dosage is 1 cc. for each 5 lbs. live weight of the affected orphan. The treatment should be repeated every 24 hours for three days by which time the affected animal should be fully recovered.

It should be always remembered with orphans that the loss of the natural environment can only be made up by extra care and attention during the first few weeks, but provided this is given, then there is no reason why healthy animals should not be reared successfully.

Records Cut Poultry Costs

The cost of producing a dozen eggs should be less than 30 cents, says David D. Jackson, extension poultryman at Purdue University. And, he adds, poultry raisers should keep records so they can check on their costs.

The poultry specialist says egg production costs generally break down in this way: Feed—65 per cent; Labor—20 per cent; Chicks—5 per cent; Miscellaneous—4 per cent (includes electricity, litter, taxes, vaccine, insurance, and repairs); Depreciation—3 per cent; Interest on Investment—3 per cent.

Jackson points out that feed costs, which cover about two-thirds of production costs, can vary considerably. For instance, when the flock is laying at the rate of 70 per cent and feed costs $3.50 a hundred pounds, it costs 16 cents a dozen for feed. But when production drops to 40 per cent, feed cost jumps to 26 cents a dozen.

He offers this guide in figuring labor costs. Most successful poultrymen are now spending less than one hour per year with each hen. One man now can care for twice as many birds as he could 10 years ago. All labor costs, including unpaid family labor, should be included.

—Indiana Extension Service

Do Your Hens Get Enough Energy?

There are many advantages to high energy feed, but costs decide levels for best profits.

Condensed from
Everybody's Poultry Magazine

Dr. R. H. Harms

THE use of "high energy" poultry feeds has gained considerable attention during recent years.

Early attempts to use feeds high in energy for broilers and laying hens were not too successful because these feeds were not nutritionally balanced. They did not contain sufficient protein, vitamins, and minerals. With the advent of synthetic detergents the demand for inedible fats and oils by the soap industry was greatly decreased resulting in a large surplus of these materials. Since fats and oils are very high in energy, the feed industry was considered to be the best possibility as an outlet for this surplus.

In the early 1950's a pound of inedible fat could be purchased at a price which did not greatly exceed the price of a pound of yellow corn. This potential source of energy prompted much successful research on its possible use in poultry feeds.

When the feed nutritionist learned how to use inedible fats and oils he found that this increased energy content of poultry feeds gave improved performance of the feed. This improvement could be measured by growth rate of broilers and pounds of meat produced per 100 pounds of feed and, with hens, by the rate of egg production and the number of pounds of feed required to produce a dozen eggs.

Energy Level Determiners

The energy content of a feed is simply determined by the feedstuffs that are included in the feed. Cereal grains are used in poultry feeds primarily as a source of energy. Since the various cereal grains contain different levels of energy it becomes evident that the particular grain used will affect the energy content of the feed. The energy content of several feedstuffs used in poultry feeds is shown in Table 1.

Reprinted by permission from Everybody's Poultry Magazine, Hanover, Pennsylvania

TABLE 1: Energy Content of Some Feedstuffs Used in Poultry Feeds*

Feedstuff	Calories/Pound Productive Energy	Calories/Pound Metabolizable Energy
Animal fat	2878	3960
Barley	813	1255
Corn	1105	1535
Fish meal (60% protein)	941	1230
Meat scraps (55% protein)	949	1249
Milo	1099	1528
Oats	810	1133
Soybean oil meal (50% protein)	790	1142
Soybean oil meal (44% protein)	761	1103
Wheat	897	1381
Wheat bran	494	759
Wheat shorts	756	1117
Wheat middlings	694	1043

*Copied from—Titus, Harry W., 1955, The Scientific Feeding of Chickens.

The "yardstick" for measuring the energy content of a feed or feedstuff is the number of calories which it contains. In poultry feeds two different measurements are in common usage: Calories of "productive energy," and Calories of "metabolizable energy." "Productive energy" is the one more widely used. (It may be noted from Table 1 that the metabolizable energy content of a feedstuff is approximately 1½ times greater than the productive energy content).

As previously mentioned the particular cereal grain which is used will greatly affect the energy content of a feed. This is true because the greater percentage of a poultry feed is composed of feedstuffs used primarily to furnish energy. Feedstuffs used primarily for furnishing energy range from 55 to 80 per cent of the total weight of the finished feed.

There is such a wide variation in the energy content of the various cereal grains that it is possible to change the energy content of a finished feed by approximately 200 Calories of productive energy per pound of feed by a simple substitution of one cereal grain for another.

It may be noted in Table 1 that corn contains 1105 Calories of productive energy per pound, as compared to 810 Calories per pound for oats. This means that if a poultry feed contains 60 per cent grain it would contain 17,-700 more Calories of productive energy if corn were used rather than oats.

Fat Can Replace Corn

If a feed with a higher level of energy is desired, corn may be replaced with animal fat. Each time a pound of corn is replaced with a pound of fat the caloric content of the feed is increased by 1723 Calories of productive energy or 17.73 Calories per pound of finished feed.

The feedstuff used as a source of protein will also have its influence upon the energy content of the feed. A soybean oil meal containing 50 per cent protein contains 29 more Calories of productive energy per pound than a soybean oil meal containing 44 per cent protein. If fish meal or meat scraps were used in feed formulation instead of soybean

oil meal the energy content of the feed would be increased. The use of feedstuffs such as wheat bran, wheat shorts, or wheat middlings result in decreasing the energy content of the feed.

Take a lesson from the pin; its head keeps it from going too far.

Three examples of feeds containing different levels of productive energy are shown in Table 2. This wide spread in energy content is made possible by the various combinations of oats, yellow corn, wheat shorts, and inedible animal fat.

Energy Requirement

Dr. F. W. Hill, of Cornell University, has indicated that a level of 945 Calories of productive energy per pound of feed is the minimum level of energy required to support a maximum rate of egg production in cold weather. During warm weather maximum production may be obtained with a feed containing less energy.

Other research workers have found that a level of at least 900 Calories of productive energy per pound of feed resulted in better egg production than from feeding lower levels of energy. Results which are typical of those obtained from feeding low levels of energy to laying hens are shown in Table 3. This table is a brief summary of two years results from feeding the low and medium energy feeds that are described in Table 2.

It is evident that laying hens can be maintained on feed which contains a low level of energy. However, the rate of egg production will not reach the maximum potential of the present day hen. Moreover, the amount of feed required to produce a dozen eggs will be considerably higher than if they had been fed a feed containing a higher level of energy.

The dairy farmer of 1970 will spend more time managing and less time milking.

Less Feed Needed

The relative efficiency of a laying hen feed is increased by approximately one per cent for each increase of 10 Calories of productive energy per pound of feed. The improved performance of a feed due to increased energy content is most noticeable in the reduced amount of feed required to produce a dozen eggs. However, if the energy level of the feed is considerably less than 945 Calories of productive energy per pound of feed, an increase in energy results in a substantial increase in rate of egg production.

TABLE 2:

Composition of Three Feeds with Different Levels of Productive Energy.

Ingredients	Level of Energy High*	Medium† (Lbs./cwt.)	Low†
Yellow corn	64.4	63.0	25.5
Oats	....	....	20.0
Wheat shorts	....	....	20.0
Animal fat	6.6	....	....
Alfalfa meal	5.0	5.0	10.0
Meat scraps, (% protein)	....	5.0	5.0
Soybean oil meal (50% protein)	18.0	....	....
Soybean oil meal (44% protein)	....	23.5	16.0
Fish meal (60% protein)	2.5	....	....
Defluorinated phosphate	1.5	1.5	1.5
Ground limestone	1.0	1.0	1.0
Salt, Iodized	0.5	0.5	0.5
Vitamin mix	0.5	0.5	0.5
Calories Produced Energy per Lb. feed	1008	900	721

* From—Hochreich et al., Poultry Science 37 : 949

† From—Harms et al., Tenn. Ag. Exp. Station Bulletin 258

TABLE 3: Rate of Egg Production and Feed Efficiency of White Leghorn Hens When Fed Different Levels of Energy*

Energy Level	Rate of Egg Production (per cent)		Feed/Dozen Eggs (pounds)	
	1954-55	1955-56	1954-55	1955-56
Low (721 Cal./lb.)	50.8	55.9	6.20	6.18
Medium (900 Cal./lb.)	58.7	61.9	5.39	5.60

* From—Harms et. al., Tenn. Ag. Exp. Station Bulletin 258.

The addition of fat to the feed of laying hens has been shown to increase the weight of eggs. Hens receiving feed containing animal fat produced heavier eggs throughout the year than did hens receiving feed that did not contain fat. However, the greatest difference in egg size between the two groups of hens was during the first six weeks of production. An increase in egg weight during the early portion of the production year is important because this is the time when so many small eggs are being produced, resulting in a reduced price per dozen eggs.

Research is now in progress to determine whether this increased egg weight is due to the presence of the added animal fat or due to the increased energy content of the feed. Regardless of the cause, this increased egg weight is important to the egg producer

—another advantage from using a high energy laying feed.

The price of the various feedstuffs will determine how much "energy" in the feed will bring the greatest profit to the producer. When the price spread is too great between high and low energy feedstuffs, the savings on the cost of a pound of low energy feed may be enough to offset the lowered rate of egg production and increased amount of feed required to produce a dozen eggs. The most economical level of energy to be used in the feed for laying hens will change each time there is a change in price of the various feedstuffs. Therefore, the job of the feed nutritionist is not only to formulate a feed that will not only support a good rate of egg production, but also make the producer the most money.

Why Antibiotics Promote Growth

Part of an antibiotic's effectiveness in promoting animal growth may be due to an increase in nutritional value of the protein in the diet, according to recent University of Wisconsin research.

Researchers say this finding adds another piece to the puzzle.

Improved digestion or possibly improved absorption may explain the growth-stimulating effect of antibiotics under certain conditions. Here are some other ideas how the materials work. The antibiotic effect may hinge on control of vitamin-using intestinal bacteria, or stimulation of intestinal organisms which synthesize needed vitamins.

In tests last year, antibiotics stimulated growth of rats and chicks which had diets that contained adequate vitamins but not enough protein for good growth. Thus, any growth stimulation could hardly be due to better supply of vitamins.

The stimulation was greatest when raw soybeans made up the protein part of the diet than when heated soybeans were used. This gave rise to the idea that antibiotics may improve digestion and/or absorption because cooked soybeans are known to have greater biological value for animals.

Antibiotics made the biological value of raw soybeans more like that of cooked soybeans. An alternative explanation—that amino acids are "spared" or synthesized when diets contain antibiotics—doesn't seem possible under the conditions of this study. Amino acids are chemicals from which proteins are built in the body.

—University of Wisconsin

Tail Biting Cure Found

Is cannibalism a problem with your swine?

Condensed from National Hog Farmer

Neal Black

SUCCESSFUL treatment in more than 50 swine herds during the past year has convinced a central Indiana veterinarian that he has an answer to that nagging problem—tail biting or cannibalism in swine.

Dr. Richard A. Spring's theories on the cause of cannibalism and his present methods of treatment have not failed him yet. He has been called as far as 200 miles to treat the problem.

Cannibalism is not new to the swine industry but has become a major problem since more farmers have moved to confinement systems of hog raising. Spring says it isn't actually caused by confinement raising of swine and he has an explanation for the increased incidence when hogs are on concrete.

But, first, the cause:

Basically, its cause is anemia (low hemoglobin levels of the blood), regardless of what is causing the anemia, Spring explains.

Spring said he has found three major causes for this anemia which he associates with cannibalism. They are:

1. A hemolytic streptococcus, an organism similar to that which causes strep throat in humans. This is the cause of the anemia associated with cannibalism in the herds he has treated.

2. Iodine deficiency. Spring said this area of Indiana is iodine deficient and hogs may require more iodine in their feed than the generally recommended levels. He said he has seen enlarged thyroid glands in practically every case of cannibalism he has posted. It's not a noticeable goiter but the gland is definitely enlarged. It will be noticed on post mortem examination, he said.

3. Any type of blood sucking parasite. Spring said when any such parasite is present in sufficient numbers to cause anemia, he has seen tail biting. The chief offender he's found is the red stomach worm which is rare in areas as far north as Indiana except in feeder pigs imported from the south.

Reprinted by permission from National Hog Farmer, Box 156, Grundy Center, Iowa

Spring said in the cases he's seen, the cannibalism usually starts when the hog weighs from 120 to 140 pounds but he has seen it in 100-pound pigs.

In explaining the relationship between the anemia and the tail biting, Spring said the tail biting may result from a craving for blood or the anemia may cause a depraved appetite similar to that caused by a phosphorus deficiency.

He said, "We almost always find the strep infection and the lack of iodine." The strep infection results in a need for more iodine and he points out that any anemia could cause a need for more iodine. In the absence of anemia, recommended iodine levels should suffice, he said.

When Spring first started working on this problem he spent many hours watching lots of hogs to catch one actually biting tails. For it's the pigs doing the biting, not those that have the chewed-up tails, that are anemic. Now he can usually recognize the tail biter in the group, especially in white hogs. The biter will have a whole tail and it will have a gray look about it. It will look anemic.

His diagnosis and treatment is based on a post mortem of one of the biters. In his post mortem examination he looks for a cause of anemia. If it's the strep infection, the kidney appears mottled. He looks for the enlarged thyroid gland or for the red stomach worms or other parasites.

There are three treatments depending upon what he finds in his post mortem examination and all three are inexpensive. They are:

1. In the case of the strep infection, he treats with sulfanilamide at the rate of one pound per 300 pounds of complete feed for 5 days.

2. If he doesn't find the strep infection but does find the enlarged thyroid, he puts the whole lot of pigs on an organic iodide compound at the rate of one pound per 500 pounds of feed for 5 days.

Sometimes he uses a combination of both at the above rates in very severe cases.

3. If he finds red stomach worms, which are very tiny and difficult to see, he worms the pigs with flavored phenothiazine at the rate of one pound per 100 pounds of feed for 24 hours. He said even when he doesn't find the worms, if the other two treatments fail, he worms the pigs. In several cases that has happened—the pigs didn't respond to the first two treatments so he wormed them and they snapped right out of it, even though no worms were found on post mortem.

Spring pointed out that other wormers designed to rid pigs of

round worms don't work on worms such as the red stomach worm.

"Results from all three treatments are very dramatic," Spring said. Improvement can be seen the first day, but in the case of the first two treatments, they must be continued for 5 days or a relapse may occur.

Swine pox, spread by body lice, is an acute infectious disease characterized by skin lesions. Purdue veterinarians recommend that lice be controlled and affected animals be isolated.

The tail biting stops right away in most cases. Spring said if it doesn't stop in 2 days there is no use continuing the treatment. He starts another treatment in those cases.

These treatments have never failed him in treating an estimated 9,000 hogs and he has not seen the cannibalism recur in any lot of hogs he has treated. He has, however, seen it time after time on the same farm in different groups of hogs. In those cases, he said, it is usually the result of the strep infection carrying over from one group of hogs to the next.

Spring discovered the relationship between the strep infection and cannibalism by running cultures on a large number of hogs which were tail biters. He said it often took a lot of talking to persuade farmers to give up what appeared to be one of their best hogs—one of the few in the lot with a tail—for his research. But he obtained enough to establish a definite relationship.

Accidentally Found Treatment

He found the strep in the kidney—never isolated it from any other organ. And he found it in a high percentage of tail biters.

He had been using the sulfa treatment for the strep infection when he discovered the iodine treatment quite by accident.

He recommended the sulfa treatment for one group of hogs and, because the tails were so badly infected, he recommended that the farmer paint the stumps of the tails with iodine. The farmer did and the pigs "went crazy" biting tails to get the iodine. Spring reasoned that if they craved iodine that badly there must be a lack of it so he tried adding it to the feed.

But the veterinarian hastens to point out that iodine used at the level he recommends is medicinal rather than nutritional.

It's not the fault of the feed if the feed contains iodine at recommended levels. Rather it's the result of an increased requirement for iodine, due to some primary cause of anemia.

Spring said two other treatments for cannibalism are being

proposed in his area. They are magnesium sulfate — epsom salts —in the water, or magnesium oxide — milk of magnesia — in the feed in very small amounts. He said both are sedatives and quiet nervous pigs and he has used them for that purpose.

They are being proposed as a cure for cannibalism on the assumption that it is caused by boredom. He admits it is possible that boredom is a cause but he's never seen a case in which he thought it was a primary cause. He considers these magnesium treatments as a covering up of the cannibalism rather than a cure.

Must Use In Complete Ration

He said it is necessary to treat the whole lot of pigs for, while the strep infection may be confined to one or two pigs, it will spread to the rest of the lot. That's why removing the tail biter sometimes works, but usually the problem reoccurs in a week or two.

He's found that with both the iodine and sulfa treatments it's necessary to feed them in a complete ration. If they are merely mixed into a supplement which is fed free choice with corn, the pigs will cut down their intake of the feed after the first couple of days and won't get enough medication.

During the first 2 days of the iodine treatment, the pigs will eat more feed because they crave iodine but after that they will cut their feed intake unless only medicated feed is available.

Spring recommends that the first step in treating cannibalism be a post mortem examination of a tail biter to determine the cause and which treatment should be used. If a post mortem should be decided against, he says either the sulfa or iodine will probably solve the problem, except in the case of southern pigs.

Hog profits are determined by the corn-hog ratio.

In regard to his theory that cannibalism is not directly associated with confinement feeding, Spring reasons that it is a matter of convenience. Anemic pigs in confinement have a better opportunity to bite tails than they do on pasture.

While turning pigs out on pasture is often used as a treatment and often produces a halt in tail biting, it isn't a cure. The anemia merely manifests itself another way, he said. The tail biters often start rooting. Sometimes the tail biting even breaks out in pigs on pasture.

Cutting off the tails of baby pigs has also been proposed as a cure, Spring pointed out. But that doesn't always work for the tail biters may simply transfer

their attention to ears. He said he has seen groups of pigs in which only the tails were bitten, other groups in which the ears were chewed and others where both ears and tails were bitten.

Seen Whole Hogs Eaten

And it can go much farther that that. He has actually seen whole hogs eaten with nothing left but skin and bones. What happens in those cases, he said, is that a pig gets weak from loss of blood through the stump of his tail and can't get up. When it is bitten again it just lies and squeals and the whole group gangs up on it and eats it.

This is the result of a severe case and is an example of how serious the problem can become. But it has other aspects which can adversely affect the farmer's profits from his hogs. For example, the stumps of the tails are a good avenue for other diseases such as erysipelas, which Spring has seen in pigs where tail biters have been at work.

Lowell Johnson, who farms near Leisure, Indiana, can testify both to how serious the problem can get and the effectiveness of Spring's treatment.

One of Johnson's hogs was eaten except for skin and bones. Johnson said Spring has treated different groups of his hogs three times and the treatment has worked "100 per cent."

It was the iodine treatment that worked for him after the sulfa treatment failed. Johnson, who farrows about 200 litters a year, said he has noticed a restlessness before he noticed any tail biting. It usually started at 125 to 150 pounds.

Agronomists recommend that farmers equip their corn planter with side-band fertilizer attachments. In normal years, larger yields will result from the same amount of fertilizer and danger of fertilizer burn in dry ground is lessened.

Johnson tried an experiment of his own. He isolated one tail biter from the group and treated the rest of the pigs with iodine. The tail biting stopped and after 5 weeks he turned the isolated pig, which hadn't been treated, back in with the others. He said he was trying to see if he could break the pig of the habit. But when he turned the untreated pig back in with the others he "went to work on the tails right away."

Everett Horine of Fairmont, Indiana, is another of the farmers of the area who will testify to the value of the treatment. He's had two outbreaks, both of which were treated successfully. In the last group, it started when the pigs weighed 100 pounds, the smallest Spring has seen with the

problem. Erysipelas entered through the bitten tails causing a further complication.

Spring laughs at "diagnoses" of "protein poisoning" or "antibiotic poisoning"—"there is no such thing, if antibiotics are fed according to the manufacturer's directions."

He "practically always" recommends an increase in protein for sick pigs which need to develop immunity. "Antibodies are protein in nature and pigs must consume sufficient protein to manufacture them." He recommends that a complete feed contain 16 per cent protein for all pigs after vaccination.

As for his treatment of cannibalism, he firmly believes it's the answer based on his experience in his area, but he recognizes that "sooner or later there will be a case which none of these treatments will cure." He believes that each case should be diagnosed by post mortem examination so that as other causes of anemia are recognized, proper treatment can be instituted without first trying those outlined above.

Selling Light Profitable Practice for Hog Producers

Hog producers can pocket extra profits if they sort their hogs out and sell them at light weights, says R. M. Godsey, Virginia animal husbandman.

Topping out the animals weighing from 200 to 220 pounds has been an accepted practice for some time now. This practice has several advantages, Godsey says. For instance, marketing a pig crop in four or five different groups take some of the gamble out of hog raising. Topping the hogs means more efficient use of feed, as feed efficiency drops off quickly as hogs go above 200 pounds.

A pound of gain can be put on for each 3 pounds of feed up to about 200 pounds of weight. At 3 cents a pound for feed, this is a cost of 9 cents per pound of gain. But the same hogs will eat from 4.5 to 5.5 pounds of feed for each pound of gain after they reach 200 pounds. This moves the feed cost up to an average of about 15 cents per pound.

A hog will put on only a small amount of lean meat from 200 pounds on. Most of the gain is in the form of lard. As the weight goes up, so does the proportion of fat to lean on a carcass. So sorting out and topping the animals makes it possible to market meatier hogs. —*Agricultural Newsletter*

Don't Let "Robbers" Take Your Sheep

Internal parasites steal life-giving blood. Stop them. . . !

Condensed from
American Agriculturist

Warren F. Brannon

HOW do you feel when a thief comes to your farm at night and removes 10 per cent of the flock.? Or when dogs get into the flock and kill 10 per cent of the animals and leave another 20 or 25 per cent permanently maimed?

You should have no less concern about the billions of worms which commonly occur in the digestive tract of the sheep. These worms, of which there are many kinds, bore tiny holes, cause raw sores in the digestive membranes, and steal the life-giving blood stream. I am sure that every producer wants to take action to correct the problem.

To determine the degree of internal parasite infestation which your flock may have you should take to your veterinarian samples of feces from one or a few sheep, and have him examine them. Infestations build up in years of abundant rainfall with damp, humid weather conditions. Symptoms of a heavily parasitized flock may be diarrhea, thin condition, pale membranes under the eyelid and in the mouth due to anemia, and in general, unhealthy sheep.

The control of internal parasites of sheep can be and should be largely done by the use of good feeding and management practices. A good roughage program is a "must" on the farm of successful sheep raisers. Plenty of top quality forage must be supplied to the flock the year around by pasture, hay, green chop, or silage in order that the sheep will receive proper nourishment to maintain good health and resistance against parasite infestation. Along with this good roughage program it will probably be necessary to supply some supplemental concentrates at various times during the year.

In management, cleanliness is foremost and must be practiced. This means cleanliness of sources of water supply, of hay racks, of grain feeding troughs, and of

Reprinted by permission from American Agriculturist, 10 N. Cherry St., Poughkeepsie, New York

pastures. One might ask how a pasture may be kept clean. This is difficult, but can be largely accomplished by a well planned, carefully practiced rotation procedure.

Recently there have been advertised in our farm magazines many new drench preparations for sheep. Most of these drenches are satisfactory when used according to the manufacturer's specifications. Several of the drenches are new formulas of old ingredients which have been used for years. Others are made of new drugs and chemicals.

At the present time it appears that none of these new preparations are a simple, complete one-shot remedy for eliminating worms from sheep. The producer must practice good care and management. The old drenches, phenothiazine and Cu-Nic (copper sulfate—nicotine sulfate) are still effective in treating most worms of the digestive tract.

For several years it has been recognized that phenothiazine is effective in the elimination of certain species of worms, while Cu-Nic is not. Also the reverse situation exists. Therefore alternate drenching with these two preparations is probably desirable. Their proper use still reduces our worm robber population and may be just as effective as our new-named drenches.

Don't Hide Your Light!

We constantly meet people—and we expect that you do, too—who love to talk about the high record being made by their best cow, or the top record made by another some time ago, or the one they think that a new animal is going to make for them.

We thoroughly enjoy their enthusiasm and share it with them—until we find out that the 'record' they are talking about is known only to them and possibly their cow. As an officially sanctioned, reputable HIR, DHIR, or DHIA record, it is non-existent—*the fellow doesn't test his cows!*

With the rapid expansion of all kinds of testing facilities throughout the nation, there is absolutely no excuse for any progressive breeder not to be testing his animals. Whatever arguments can be mustered for not testing, the fact remains that the value of a good record for publicity, advertising and breed promotion, far exceeds its nominal cost.

And if cost is a factor for not testing, remember that the animal with a good record sells for considerably more money than the animal with no record. The difference will pay for testing many cows.

—*The Ayrshire Digest*

"Spring Grass" 8 Months Out Of The Year

A feeding calendar to boost milk yield for this Wisconsin farmer . . .

Condensed from Capper's Farmer
Norman Reeder

"GREEN feeding has done more to boost milk yield than anything else we have ever tried," says Gordon Priedeman of Waukesha county, Wisconsin. "It has meant 20 per cent more milk per cow from a larger herd than we could ever carry before."

Priedeman's records back up his high opinion of the green feeding system. Last year his Guernseys made an average of 513 pounds of butterfat and 10,114 pounds of milk.

This dairy farmer is producing the forage and a substantial part of the grain for 40 head of milk stock and around 50 head of calves and yearlings on 151 acres of hilly land. He estimates that he is now getting two to three times as much milk from the acres he used to pasture during the summer, even tho he followed a plan of rotational grazing.

Since he started green feeding 3 years ago, Priedeman has developed a cropping system which makes the most of this new way of handling summer forage. By starting and closing the season with fall-seeded rye, he has added 2 extra months to the regular pasture season. Moreover, he is feeding green stuff of prime-milk making power over this stretched-out 7-months' season.

Instead of waiting until early May to get cows on spring greens, Priedeman now turns them out on young rye the first warm growing days of April. This feed is full of milk-making magic—hormone or whatever it is; the same magic that has always brought on a spring flush of milk when cows go out to pasture.

"These cows milk like fools on rye," is the way Priedeman describes it.

More than 100 million bushels of U.S. corn — about 2.9 per cent of the nation's entire crop — were lost because of European corn borer damage in 1958.

Reprinted by permission from Capper's Farmer, Topeka, Kansas

The rye season lasts about 30 days. By the second week in May this crop is getting pretty well headed out. Digestibility is falling off. It has lost its punch as a milk-making feed. Cows won't eat as much.

Cattle numbers in the United States increased by 3,500,000 head from January 1958 to January 1959. Most of the increase was in young beef stock.

But meanwhile Priedeman's 80 acres of alfalfa-grass meadows have reached bud stage. There is a 16- to 18-inch growth of milk-packed forage ready for green feeding and the start of the grass silage-making season. So early in May this dairyman switches crops and his cows go on producing full tilt.

As soon as rye falls off in quality, Priedeman plows it under and seeds the land to Sudangrass. He has 16 acres in a Sudangrass-rye rotation. This is a special cropping program he has set up alongside his regular rotation of corn-oats-alfalfa.

Thru May and June the first and second growth meadow crop keeps the cows on feed of excellent quality. Toward the end of June they get a little chopped green oats. Priedeman goes around the edges of his grain fields while oats are in late boot to milk stage to open up for combining later. It saves the feed the combine would waste by flattening the outside swath.

By the tenth of July Sudangrass is ready to chop. This fast-growing, hot-season crop is at its best right when meadows are slacking off. Sixteen acres of Sudangrass take the pressure off meadows so Priedeman can harvest most of the second and all of the third cuttings for hay.

As September opens, this dairyman turns under the remains of his Sudangrass crop for another seeding of rye. His cows are now on green chopped corn which will be the backbone of their forage for the next six weeks. With chopped corn, he starts feeding some of the good grass silage he put up in early summer.

All of the corn crop on this farm goes for green feeding and silage. Harvesting the whole corn plant nets around 50 per cent more nutrients to the acre than harvesting just the ears. Priedeman buys what corn he needs for the grain ration.

About the middle of October, when hard frosts are due, he figures to have the corn used up. By that time the rye he seeded 6 weeks earlier has made about a 6-inch growth. It is ready to provide some green feed as late as November 20.

Priedeman doesn't get a high tonnage of feed from rye in the fall, but even a small amount helps to stimulate milk flow.

Rainfall along the Pacific Coast varies from 2 inches per year in the California desert to 100 or more in the Olympic Peninsula of Washington.

Whatever the green feed cows are on, they get good hay along with it. Priedeman says his cows eat about 7 pounds of hay per day per head—winter and summer. Hay helps to keep dry-matter intake up to the level required for top milk production. It is also insurance against slumps in milk flow as green crops approach maturity and fall off in digestibility and taste appeal.

As cows go into the fall feeding period, there is always a supply of extra high quality grass silage to make up for any shortage of green feed.

Priedeman has been making grass silage for 21 years. He wilts alfalfa before chopping, then uses 5 gallons of molasses to the ton to insure good fermentation. Molasses is metered into the blower so that every ton gets the right amount.

To make it easier to control the flow, he dilutes molasses with an equal amount of water.

One problem that troubles some dairymen who have gone to green feeding is wet ground. There are bound to be a few days when ground is so soft that a loaded wagon will cut in, rutting the field. Priedeman gets around this by keeping 8 acres next to the feeding yard in tough, permanent bluegrass.

He has been treating this emergency pasture in early spring with 125 pounds to the acre of 32 per cent nitrogen fertilizer. This treatment starts the pasture a week to 10 days earlier.

When dynamite explodes, the powder or liquid changes into gaseous form which occupies 8,000 to 10,000 times the space it previously did, thus producing tremendous power.

The yield of grass is three to four times as much as he gets on an unfertilized check strip in the pasture. And there is good grazing when he needs it well into the usual dormant season for bluegrass. That check strip really demonstrates the benefits from using high nitrogen fertilizer on grass pastures.

Changing from rotation grazing to green chopping hasn't called for much special equipment on the Priedeman farm. He has a flail-type chopper especially for this purpose. But wa-

gons used to haul green chop to the cows are regular equipment for silage harvest.

In the yard he has a mechanized feed bunk which distributes either green chop or feed from an 18- by 36-foot silo, according to season. This bunk is on an elevated concrete platform which is completely covered.

In winter Priedeman puts up a portable windbreak along the west side of this feeding platform. He takes it down for summer feeding so cows can get the full benefit of breezes. In rain, snow, or heat, his cows feed in comfort.

Gordon Priedeman's Feeding Calendar

JAN. — Corn silage, grass silage, hay
FEB. — Corn silage, grass silage, hay
MAR. — Corn silage, grass silage, hay
APR. — RYE pasture, hay
MAY — Green chopped ALFALFA, hay
JUNE — Green chopped ALFALFA, OATS, hay
JULY — Green chopped SUDAN-GRASS, hay
AUG. — Green chopped SUDAN-GRASS, hay
SEPT. — Green chopped CORN, hay
OCT. — Green chopped CORN, RYE pasture
NOV. — Silage, hay, RYE pasture
DEC. — Corn silage, grass silage, hay

Fast-Gaining Bulls Sire Fast-Gaining Calves

Recent feeding trials have shown that fast-gaining bulls sire fast-gaining calves. These trials are proof of the value of performance-testing beef cattle, reports G. R. Carlisle, University of Illinois livestock specialist. Fast-gaining bulls also require less feed per 100 pounds of gain. And they pass this ability along to their offspring.

Carlisle cites a recent Kansas Experiment Station feeding trial in which three different bulls, a slow gainer, a medium gainer, and a fast gainer, were bred to three groups of cows of similar age, weight and type. Calves sired by each bull were fed for 232 days after weaning.

Calves sired by the fast-gaining bull not only gained 62 more pounds than those sired by the slow-gainer, but did it on 94 pounds less feed. Medium-gaining calves outweighed the slow gainers by 30 pounds and required 61 pounds less feed.

—*University of Illinois*

Iron Deficiency and Anemia In Pigs

Effects of this disease on growth and vigor make its prevention more rewarding than its cure . . .

Condensed from Farming in South Africa
Dr. R. K. Loveday, Division of
Veterinary Services, Onderstepoort

ANEMIA, or a reduction in the number of red blood cells or of the amount of blood pigment (haemoglobin) in the circulating blood, commonly occurs in suckling piglets whose diet is deficient in iron.

The body requires iron as well as traces of copper for the production, in the red cells, of haemoglobin, the pigment essential for the transportation of oxygen to the tissues and the removal of waste products from these tissues. Iron also forms part of several body enzyme systems.

Piglets are born with iron reserves for only a few days, and when reared outdoors normally obtain sufficient iron for their rapidly increasing haemoglobin requirements from the soil. Litters reared on concrete obtain only about half the necessary iron from the sow's milk and their surroundings, and rapidly develop iron-deficiency anemia if extra iron is not made available. It has been found impossible to increase the piglet's iron reserves or the iron content of the sow's milk by feeding iron to the pregnant sow. Instances in which anemia is reported to have been prevented in this way are probably due to the consumption of the sow's iron-rich dung by the piglets. Cold, damp surroundings aggravate the disease.

Iron-deficiency anemia causes widespread piglet mortality wherever litters are raised on concrete without access to supplementary iron. It is also responsible for the production of unthrifty, uneven litters with low resistance to other diseases. The direct and indirect losses caused annually by this disease are enormous.

Symptoms

Affected piglets are usually recognizable at 3 to 4 weeks when they appear plump and stocky, with a tendency to fullness of the neck. The white breeds are noticeably pale, particularly on the ears. Such pig-

Reprinted by permission from Farming In South Africa, Department of Agriculture, Pretoria S. A.

lets lose this stocky appearance and continue to grow fairly normally if they obtain iron at this stage, either from outdoor grazing or iron-fortified creep feed. In the continued absence of sufficient iron, however, they soon become lethargic, stop growing and appear more hairy than usual. Exertion causes breathlessness, and the litter is very prone to develop scours due to its decreased vigor.

Deaths occur, usually suddenly at any age from 3 weeks, often at 6 to 8 weeks, from organic damage caused by the earlier acute anaemic state. Runt piglets may appear in the litter at any stage after 3 weeks.

The carcass is pale, the heart often enlarged, and an excess of clear fluid may occur in the pericardial sac, chest and abdominal cavities. The liver often shows irregular pale markings and has a finely-speckled appearance. The blood of piglets which die at between 3 and 4 weeks is noticeably watery. Signs of enteritis may be present where a secondary diarrhea has occurred.

Prevention

The profound effects of this disease on growth and general vigor make its prevention infinitely more rewarding than cure. Preventive measures should commence within the first week before the piglets iron reserves become exhausted.

Daily outdoor grazing from the age of four days should supply all the iron necessary, but if this is impossible a spadeful of clean soil should be placed in the farrowing pen daily for the first fortnight. This soil may be fortified with about 5% of finely-powdered commercial ferrous sulphate, which usually contains traces of copper as an impurity.

Old timers can remember when baby sitters were called mothers.

An iron-copper paste for dosing piglets at 3 and 10 days of age is available commercially, piglets can be dosed at these ages with a teaspoonful each of a mixture containing 3 drachms of ferrous sulphate and 1 drachm of copper sulphate dissolved in 1 pint of water. *Also available commercially are iron injections used as a single intramuscular injection at 3-4 days for each piglet.* The litter should be protected against cold and provided at three weeks with a 19-20% protein creep feed to which is added, ½ lb. ferrous sulphate per ton.

Iron injections usually effect the most rapid recovery and are given at twice the preventive dosage. Alternatively, piglets may be dosed every second day for 10 days with the paste or mixture mentioned above.

High Moisture Corn

An Iowa farmer kept wet corn and made it work . . .

Condensed from Indiana Farmer

Bernie Vonderheide

FARMERS are learning that they can store corn at a high moisture content, let it ferment, and end up with more valuable feed than if they dried it artificially or let it dry in the field or crib.

The whole thing really got started back in Iowa a number of years ago. On the Brandt farm, some 40 miles from Waterloo they had a crop of soft corn. It, naturally, wouldn't keep in a long-term program. Mr. Brandt reasoned that if corn would keep when chopped with full stalk, why wouldn't it keep just as good alone if the moisture content is proper for good fermentation? Brandt's idea was right.

This was in 1945, and storing corn at a high moisture content has been an accepted practice on that farm ever since. Russell Brandt, who succeeded his pioneering father in the operation, is now storing the corn very extensively. As a matter of fact, he is using some six or seven silos of this grain silage.

As we see it, there are three basic areas where storing high moisture corn has definite advantages.

1. Cost —

The initial investment in equipment and structures to harvest and store high moisture shelled corn is more than that for the other methods. However, annual costs are less, because field losses are reduced below those for ear corn harvesting and you don't have costs for artificial drying.

At the University of Illinois, their tests showed that for a 6,000-bushel volume, the cost difference was in favor of high moisture shelled corn. It was

Reprinted by permission from Indiana Farmer, Huntington, Indiana

$240 cheaper than heated air drying; $222 better than using supplemental heat; and $114 better than harvesting and storing ear corn.

Elbows bend the way they do to make it hard to pat one's self on the back.

2. Earlier Harvesting —

With the high moisture corn storage method, you can pick your corn some three to four weeks earlier than you would otherwise. This means that you can harvest your corn at its optimum moisture level—generally considered to be 30 per cent. At the 30 per cent level, you should have less field losses due to shatter.

Harvesting early also permits you to plant corn with a much later maturity date resulting in higher yields. You also don't have to worry about the problem of frost or freezing.

You can get your cover crops back on the field at a much earlier date than normally would be done. Plants infested by corn borers aren't completely down when you harvest earlier, and they are easier for the machine to pick up.

It's generally more favorable weather, shirt-sleeve weather, and the labor supply will be more plentiful.

3. Feed Value

It is well known that corn harvested at 30 per cent moisture level is at its highest nutrient level. We begin to decrease our feeding value as we lower the moisture level.

Henry Long, president of the National Silo Association points out that feeding high moisture corn will reduce the protein requirements of your animals, thus lessening your costs to feed.

"When you get all the stories in from the different experiment stations," says Henry, "we are cutting our cost of gain in beef between 12 and 15 per cent. In hogs, we apparently are not making that much of a reduction in gain cost, although we are provoking some type of a lesser cost. But this lower cost is not stemming necessarily from the fact that the grain is less. Apparently, the protein requirements have been lessened."

Paul Miller, at Fortville, Indiana, is a good example of what Henry was pointing out. Paul has been using high moisture corn for two years now. He has never, however, been able to put up quite enough to answer all his feeding needs. So, when his high moisture corn plays out, he has to go to his dry corn. Paul says that he is amazed to find an accelerated need for protein when he feeds his dry corn, as com-

pared to feeding high moisture corn.

"It has pretty generally been observed," says Henry, "that protein intakes have been rather drastically reduced in high moisture corn. But to say that we are putting more gain on for the same amount of corn, or cheapening the cost of gain as far as dry moisture corn is concerned—I don't think we are licensed yet to say that."

4. Other Advantages

With this storing process, you eliminate any danger of losses from rodents, fire or theft. The corn is ready to be fed. In the spring of the year, when your field work becomes heavy, you don't have to stop the tractor and grind up a bunch of corn for your hogs and cattle. High moisture corn can be fed automatically with unloaders, screw feeders and bulk feeders.

Agriculture buys more petroleum than any other industry—nearly 15 billion gallons a year.

Now, what are some of the disadvantages of storing high moisture corn?

1. You can't cash your high moisture corn in. A farmer might want to liquidate it, but there's no market. However, right now the University of Illinois is experimenting with drying this corn that has already been fermented and seeing if it retains its feeding advantages.

2. The Government will not put wet corn under loan.

3. You'll need additional equipment to handle this corn in feeding it to your livestock.

4. At least three inches of grain must be fed out daily to prevent mold spoilage. This varies with the temperature and humidity.

Livestock can have brucellosis for years without showing symptoms.

What kind of structure do you need for storing high moisture corn?

In the Corn Belt, three types of structures are now used to store high moisture shelled corn. They are air-tight bins, including glass-lined and galvanized steel grain bins; conventional upright silos, made of poured concrete and concrete or tile stave; and metal bins with plastic bag or liner.

The general consensus of opinion among the silo manufacturers seems to be that any silo that is capable of storing adequately grain silage, would be okay to stand the load of high moisture shelled corn.

Besides shelled corn, you can also put your corn into high moisture storage after grinding the shelled corn; or, put it up as chopped ear corn; or, as ground ear corn.

The high moisture corn process really boils down to eliminating the "middle-man." Rather than harvesting corn, drying it for storage, then putting moisture back into it for feeding—you just eliminate the drying process and the field losses and nutritive losses that go with storing corn this way—and keep your corn in storage at a moisture level which your animal can use most efficiently for more profitable gains.

High-Moisture Corn Gives Good Lamb Gains in Test

High-moisture corn produced just as fast and efficient lamb gains as did No. 2 corn in a recent Missouri test.

C. V. Ross, Missouri associate professor of animal husbandry, says that 26 wether lambs fed high-moisture corn made slightly higher and efficient gains than did 28 other wethers getting No. 2 corn. However, the reverse was true with the 64 ewe lambs in the test.

Thus, the average of the two groups showed there was little difference in rate of gain between the lambs getting high moisture corn and those fed No. 2 corn.

There was a slight difference in efficiency of gain in favor of the high-moisture corn, Ross notes.

No great differences were noted in carcass grade or yield in lambs fed the two different rations.

Ross says the two rations were the same with the exception of the high moisture and No. 2 corn. Soybean oil meal, molasses, ground alfalfa hay, and aureomycin supplemented the two basic rations.

The wet corn contained 27½ per cent moisture and was stored in air-tight plastic bags. There was little spoilage with this method of storage and the lambs ate the wet corn readily.

Picking the corn wet resulted in a higher yield an acre—on the basis of dry matter content—than when it was harvested later as No. 2 corn. Also, feeding wet corn makes it possible for feeders to pick corn at their convenience and reduces field losses from shattering and shelling. *—University of Missouri*

50 Years of Feeding Progress

How cattleman have benefited from feeding research . . .

Condensed from
Western Livestock Journal

FIFTY years hence, your children and grandchildren may feed cattle that gain 42% faster on 30% less feed at 33% less cost compared to those in your feedlot today.

Your parents and grandparents could have quoted these figures in 1908 for, according to tests completed last fall, they held true for that 50-year interval. Chances are, however, that they will fall short of gains in the next 50 years—if research progresses at the rate it has in the past 10 years or so.

Basis for these figures is a 1958 test, using identical twin Hereford calves, comparing the value of our present nutritional "know how" and that available in 1908. Statistically speaking, data from one set of identical twins is equivalent to feeding 10 to 20 steers.

This test was reported to convening members of the American National Cattlemen's Assn. by Dr. W. M. Beeson, professor of animal science at Purdue University, Lafayette, Ind. Dr. Beeson went on to predict that "advances in the field of beef cattle feeding and production in the next 20 years will be unparalleled in history of the cattle industry."

He outlined briefly some of the most significant research accomplishments in beef cattle feeding during the past 10 years.

Use of Hormones in Fattening Rations. Approximately 75% of the cattle in feedlots are either implanted or fed stilbestrol. Diethylstilbestrol, a synthetic hormone-like substance, is a growth stimulant which increases the formation of protein but does not increase fat deposition.

Numerous research studies have shown that either feeding 10 mg. daily or implanting 36 mg. of stilbestrol at the base of the ear will improve daily gains approximately 16% and feed efficiency an average 12%. Cattle on fattening rations respond the same to implanted or oral stilbestrol. On pasture, cattle respond much better to implanting than to oral feeding.

Reprinted by permission from Western Livestock Journal, 4511 Produce Plaza, Los Angeles 58

Recent research at Ohio showed that a combination of stilbestrol and certain testosterone (male hormone) derivatives is more effective for heifers than stilbestrol alone.

When the temperature of an egg holding room is maintained at 60 degrees and the humidity is kept at 80 per cent, eggs will be of top quality at the end of a week.

Certain natural hormone combinations such as estradiol and progesterone have given results equivalent to the effect obtained from stilbestrol. Many new combinations of estrogens and androgens are now being tested, and no doubt we will soon have other ways of influencing growth in cattle.

Effect of Stilbestrol on Suckling Beef Calves. Tests at Oklahoma State University have shown that implanting range calves at 90 days of age with 24 mg. stilbestrol will increase weaning weight 34 to 53 lbs. In both heifers and steers, feeder grade was nearly one-third grade higher for implanted calves.

Creep feeding 5 mg. of stilbestrol daily to suckling calves did not improve daily gain. Controls gained 3.25 lbs. daily, those fed stilbestrol 3.13 lbs. and calves implanted with stilbestrol 3.85 lbs. Recent Nebraska tests also showed that incorporating stilbestrol in creep feed will not increase daily gain of calves. Creep-fed controls gained 2.06 lbs. and stilbestrol creep-fed calves 2.07 lbs. daily.

Response of Grass-Fed Steers to Stilbestrol. Numerous experiments have shown that implanting 24 mg. of stilbestrol in yearling steers going on pasture will increase daily gain about 20% or produce 40 to 50 lbs. extra gain during a normal grazing season.

USDA experiment at Mandan, N. D., showed that range steers implanted with 30 mg. of stilbestrol and grazed on native grasses gained 48 lbs. more per head than non-implanted steers on the same pasture. Average daily gain of implanted steers was 2 lbs., while non-treated steers averaged 1.7 lbs. In other words, a 50c per head or less cost for implanting (labor and stilbestrol pellets) produced a steer worth $12 more on a 25c market.

Steers fed grain on pasture respond markedly to implanting with 24 mg. of stilbestrol, but little or no response is obtained from oral feeding. In a Purdue test, steers implanted with 24 mg. of stilbestrol gained 13% faster on 11% less feed than controls, while steers fed 10 mg. of stilbestrol orally gained 5.5% less

and required 7% more feed than controls.

Feedlot Response of Cattle Previously Implanted With Stilbestrol. A majority of the tests conducted at college experiment stations have shown that feeder cattle previously implanted with stilbestrol will respond to a second implant of stilbestrol or to oral feeding. Also, stilbestrol-treated feeder steers not fed or implanted with stilbestrol in the feedlot will gain as rapidly as untreated feeder steers.

Critical tests have shown that a stilbestrol implant of 24 to 36 mg. lasts about five to six months and, after this period, steers can be re-treated with stilbestrol and a second boost is obtained.

An experiment in Wyoming gave the following results: (1) Yearling steers on range grasses implanted with 36 mg. of stilbestrol gained 1.79 lbs. daily and untreated steers 1.62 lbs. (2) In the feedlot, the untreated steers gained 2.28 lbs. and the stilbestrol steers 2.16 lbs. daily (difference not significant). (3) When both groups of steers were implanted with 36 mg. of stilbestrol in the feedlot, the untreated feeder steers gained 2.83 lbs. and the feeder steers previously implanted gained 2.63 daily. This shows that a significant increase in daily gain can be obtained by a second implanting, but the increase is not quite as great as the initial effect from stilbestrol.

In a Kansas experiment, steers implanted with 24 mg. of stilbestrol on pasture out-gained untreated animals by .2 lb. daily during the grazing season. In the feedlot, the treated steers gained 3.7 lbs. daily for 100 days, .4 lb. more than untreated steers. Both groups were fed stilbestrol during the fattening period.

Don't neglect hog cholera vaccination. All swine on the farm should be immunized. Pigs should be vaccinated when they are between six and 10 weeks of age.

Tapazole (A Goitrogen). Tapazole (1-methyl-2 mercaptoimidazole) is a very potent antithyroid agent used to treat hyperthyroidism in humans. A report from Iowa indicates that feeding 200 to 600 mg. of tapazole daily to cattle increased gain and feed efficiency above the effects of stilbestrol. Gain differences were rather marked for the first 79 days but tended to taper off as the feeding period progressed. At completion of the experiment, differences in daily gain were small between controls and tapazole-fed steers. Some improvement in carcass quality was noted by feeding tapazole.

Experiments reported from other stations have shown no stimulation from tapazole under their feeding conditions. The application and possible use of tapazole is still in the experimental stage.

Over 85 per cent of the food produced today undergoes some processing prior to its consumption.

Antibiotics. The adaptation and use of antibiotics in beef cattle diets has grown slowly but steadily. The two most effective antibiotics at present are aureomycin (chlortetracycline) and Terramycin (oxytetracycline). Under certain feeding conditions, the oral feeding of 70 to 80 mg. of either of these broad spectrum antibiotics will increase daily gain 10%, improve feed efficiency 8% and improve carcass quality of cattle.

Antibiotics are additive in their effect over and above stilbestrol and tend to counteract the slight depression in carcass quality obtained by stilbestrol administration.

Antibiotics are most widely used in commercial feedlots and have not been universally adapted as yet by cattle feeders. It costs less than 1c per head daily to feed an antibiotic—and the return in feedlot performance, carcass quality and health of the animal far surpasses the cost.

A Kentucky experiment showed that a combination of Terramycin and stilbestrol implant is superior to stilbestrol alone for steers on pasture. Terramycin was fed in salt at a rate of 80 mg. per head daily. Control steers gained 1.07 lbs. daily; 24 mg. stilbestrol implant, 1.37 lbs.; and stilbestrol plus Terramycin, 1.59 lbs. On an average, Terramycin produced an additional gain of .22 lb. daily.

Antibiotics are also used effectively at high levels (350 to 500 mg. per head daily) to control shipping fever.

Tranquilizers. The impact of tranquilizers (ataraxic drugs) on various phases of cattle production is still in the experimental stage. Feeding 2.5 mg. of hydroxyzine (Tran Q) to steers along with stilbestrol and Terramycin has increased daily gain on an average 12% and improved feed efficiency 10%. This is over and above the effect of stilbestrol and Terramycin.

Also, tranquilizers are being used to reduce the shock of shipping and weaning calves.

Other Feed Additives. Many other nutritional factors and feed additives have been tested in beef cattle rations with inconsistent or negative response.

Research data reported to date indicates that addition of arsenicals, active dried rumen concentrates (4 billion live cells per gram), live cell yeast (20 billion live cells per gram), dried brewers yeast, fish solubles and dried molasses solubles will not improve gain, feed efficiency or digestibility of nutrients for beef cattle.

Alfalfa Meal. Dehydrated alfalfa meal (17% protein) contains some unknown factor and/or factors which stimulate gain and improve utilization of feed by cattle on both growing and fattening rations. Cattle require a minimum of .5 lb. alfalfa meal per head daily, and many feeders are using 1 to 3 lbs. of alfalfa meal or pellets to improve rations.

Pelleting. Research reports from several experiment stations have shown that pelleting poor grade hays and other roughages will increase consumption, improve daily gain and feed efficiency. Pelleting high-energy diets has not improved daily gain of cattle but, in some instances, has increased feed efficiency about 14%.

There is great interest in the pelleting of all types of roughages such as sorghum silage, corn silage, etc., and many large feedlots will adapt this method. Pelleting has gained in popularity in the formation of supplements for beef cattle. Cattle will usually eat pelleted feed much quicker than they will meal, and it also permits the simultaneous feeding of nutrients in a condensed form.

Range Supplements. Range grasses are known to be low in protein, vitamin A and phosphorus many months of the year —especially when the forage is dry and mature.

Mink breeders in Wisconsin fed over 2,750,000 pounds of cottage cheese to their minks in 1955. They discovered that adding cheese and dried milk to the diet adds sheen to the animal coat.

Research at the U. S. Range Livestock Station, Bozeman, Mont., showed the benefits of adding phosphorus and vitamin A to a protein supplement. A 20% protein supplement was fortified with 1% phosphorus and 5,000 I.U. of vitamin A per pound. At the end of the winter range season, calves on fortified pellets were 24 lbs. heavier.

Mixed Supplements vs. Soybean Meal. For many years, standard practice in the feedlot was to feed either straight soybean meal, cottonseed meal or linseed meal to cattle. This era is steadily but surely becoming a thing of the past.

Research has shown that, in addition to protein, cattle need other nutrients to balance deficiencies of the average feedlot ration. The most critical nutrients and additives in a good cattle supplement are (1) good source of protein, at least two-thirds from natural plant origin, (2) alfalfa meal (dehydrated) for unidentified growth and rumen factors, (3) molasses, readily available source of energy and palatability, (4) dicalcium phosphate or bone meal to supply adequate calcium and phosphorus, (5) salt for sodium and chlorine, (6) cobalt for synthesis of vitamin B^{12}, (7) vitamin A to protect against deficiency, especially with poor-quality roughages.

The formula for Purdue Cattle Supplement A supplies these nutrients:

Purdue Cattle Supplement A
(32% Crude Protein)

Ingredient	Pounds
Soybean meal	650.5
Molasses	140.0
Alfalfa meal (dehydrated)	140.0
Bone meal	52.0
Salt with cobalt[1]	17.0
Vitamin A, D concentrate[2]	0.5
	1,000.0

[1]One ounce of cobalt sulfate is added per 100 lbs. salt.

[2]Stabilized dry vitamin A and D concentrate containing 4,540,000 U.S.P. units of vitamin A and 567,500 U.S.P. units of vitamin D per pound.

Research at Purdue (1957) showed that a mixed supplement (Supplement A) balanced according to the nutrients outlined above is superior to feeding soybean oil meal to balance a steer fattening ration. The steers were self-fed a mixture of eight parts ground ear corn and one part supplement. No stilbestrol or antibiotics were used. There was significant improvement in daily gain, lower cost of gain, higher carcass grade and dressing per cent, and increased profit per steer by feeding a mixed supplement. Steers fed the mixed supplement made $32.74 more profit per head than those fed straight soybean oil meal.

How Deficiencies Affect Trees

Low potassium in apple leaves can lead to small fruit size, poor color, and decreased yield.

Low magnesium has been associated with decreased fruit size, decreased fruit color, decreased yield, excessive pre-harvest drop and undesirable high fruit acidity.

Low nitrogen trees produce a low yield of small woody fruit. Excessive nitrogen can cause poorly colored fruit.

Feeding The Young Pig

Thrifty meaty hogs start with good feed . . .

Condensed from Breeder's Gazette

John B. Hensley

A supply of good food is the main factor in determining the vigor and rate of development of the pig from birth to weaning.

The mother's milk is first in importance especially the first month after birth, and second is the appropriate dry feeds to supplement it during the last half of the nursing period.

When a good supplement or creep ration is provided, pigs can generally be weaned earlier because of their heavier weight. Also they are not as apt to show a reduction in rate of gain just after weaning. The feed a pig eats during its early life is used very efficiently.

At two or three weeks of age, the pig begins to note with interest their mother's rations. This interest should be encouraged, because at this age pigs have the teeth and digestive apparatus to successfully use small quantities of solid food. The sow produces her maximum flow of milk about three weeks after farrowing, and from this time on, the decreasing supply must be supplemented to meet the needs of the pigs whose feed requirements are increasing daily.

The pigs should not be required to take their chances at the trough with the sow, especially when several sows and litters are together. They get little feed and often come out of the scramble permanently crippled. Also a creep is desirable because the small digestive capacity of the pig prompts him to eat often. His extraordinary capacity for growth can be satisfied only when his feedings are not too far apart.

In recent tests conducted at South Dakota State College, pigs were weaned at various ages to determine the influences of weaning age and weight on performance up to 8 weeks of age.

In these tests, four litters of eight pigs each were selected. The pigs were all weighed when they were 4 weeks old and again at 5 weeks. The largest four pigs

Reprinted by permission from Breeder's Gazette, Columbia, Missouri

from each litter were weaned at 5 weeks and the four smaller pigs were left on the sow until they were 6 weeks old. At weaning, eight pigs were placed in each pen and fed the same ration.

Cigarette irritants CAN'T be as bad as the commercials.

Results of this trial are shown in the table. There was very little difference in overall rate of gain from 4 to 8 weeks of age between the pigs weaned at 5 or at 6 weeks. However, there were some interesting differences in gains by weekly periods. The heavier pigs in these litters gained 0.9 pounds more per pig during the first week of this test when all pigs were still nursing the sows. This indicates the trend which often occurs — the larger pigs getting farther ahead of the smaller ones when all are left with the sow. During the next week the pigs that were weaned gained only 1.1 pounds, while their smaller littermates gained 3.0 pounds when left on the sow.

While our Colleges and Universities continue to run experiments and search for new ways of helping the farmer, commercial companies likewise are hard at work in this same field. They are constantly finding new products that are playing a big role in seeing that the farmer gets to market with more and healthier livestock.

So is the case of creep-feeding pigs. What better and more opportune time is there to start a litter in the right direction? Many of these new animal health products can be included right in the ration.

One of the best signs of an intelligent person is his readiness to admit that he knows nothing about this or that.

Tests at the University of Maryland have shown that adding Hygromycin to the creep ration of baby pigs, prevents infestation of worms.

TABLE I

Weights and Gains of Pigs from 4 to 8 Weeks of Age When Weaned at 5 or 6 Weeks of Age.

	Weaned at 5 Weeks			Weaned at 6 Weeks		
Age Weeks	Average Weight	Av. Da. Gain Each Week	Av. Da. Gain Accumulative	Average Weight	Av. Da. Gain Accumulative	Av. Da. Gain Each Week
4	15.1	....	....	12.9	....	....
5	18.2	0.45	0.45	15.3	0.34	0.34
6	19.3	0.16	0.30	19.2	0.56	0.45
7	24.9	0.80	0.46	21.4	0.30	0.40
8	30.9	0.86	0.57	27.8	0.92	0.53

The University of Kentucky proved that Furazolidone was effective in stopping pig scours and increasing gains.

Products like Terramycin, Aureomycin, Arsanilic Acid, Penicillin, Bacitracin, Piperzine and many others have all been used to combat diseases and stimulate growth.

New and better feeds are being produced. Where there used to be the feeling that the pig could get by on the same ration as the sow; today, specially manufactured pig feeds are common.

It has always been said that "young gains are cheap gains," and creep feeding is one of the best means of getting this young gain.

Ear vs. Shelled Corn When Ground for Pigs

While hogs sometimes gain faster on ground shelled corn than they will on ground ear corn, the latter choice can still get pigs to market in good time.

This point was brought out in experiments at the University of Minnesota's Southern Experiment station. Researchers compared the two forms of corn and two different protein levels on 150 pigs.

In spite of slower gains, hogs on ground ear corn still reached market weight before 180 days old. This is good performance anywhere. And some tests in earlier years have shown no difference between shelled and ear corn anyway. So depending upon the type of corn he has, a producer can normally plan to feed either form to hogs and get good results if he properly balances his ration for all nutrients.

For both ground shelled corn and ground ear corn, the researchers fed one group of pigs 18 per cent protein up to 100 pounds and 15 per cent from then on and fed another group a 15-12 per cent protein ration.

The protein level differences didn't affect rate of gain or carcass quality. Pigs on ground ear corn gained about 1.53-1.54 pounds daily, and required 349 pounds of corn—on a shelled corn equivalent basis—for each hundred pounds gain.

With ground shelled corn, the story was the other way around. Daily gain was 1.76-1.79 pounds per day but feed requirement was 392 pounds for the high protein level and 367 for the lower one.

—Hampshire Herdsman

How Much Fiber In The Ration?

This English article tells about recent pig-feeding experiments in Northern Ireland.

Condensed from Pig Farming

K. L. Robinson,

Queen's University, Belfast

THE alimentary system of the pig is not well adapted for the use of bulky fibrous foods and pigs are, therefore, pre-eminently consumers of cereals and other concentrates.

Although it is well known that a high level of fiber in their diet will markedly retard their growth, there is nevertheless a general opinion that some fiber is essential in pig meals to give an open texture and to prevent the animals from becoming constipated.

Many experiments have been carried out to find the best levels of fiber appropriate to particular conditions of feeding, management and economics, and to the prevailing carcass requirements.

Since these conditions and requirements are always varying, there can be no precise answer to the general question: "What is the correct level of fiber for the feed of meat type hogs?" Nevertheless, much information is available on which to base advice to the individual farmer, having in mind his own particular circumstances. Before going further, however, we ought to take a look at the idea that some fiber is essential for pigs if they are to grow and thrive satisfactorily.

The available evidence suggests that, given an otherwise suitable diet, pigs can thrive on very low intakes of fiber. In the years between the two world wars, when skim milk and corn meal were cheap and plentiful, it was a common practice to fatten pigs almost exclusively on these feeds.

Experiments carried out at the Agricultural Research Institute, Hillsborough, Co. Down, at that time, to study the effect of high levels of corn meal on backfat quality, confirmed that consistently satisfactory liveweight gains, averaged 1¼-1½ lbs. per day, could be obtained from low-fiber diets, the crude fiber contents of which were less than four per cent.

American experience has also

Reprinted by permission from Pig Farming, Lloyds Chambers, Ipswich, Suffolk

shown that soybean/corn diets, suitable supplemented with vitamins and antibiotics, are capable of securing good growth rates.

In more recent experiments at Hillsborough in another connection, average liveweight gains—from weaning to slaughter — of 1¾ lbs. per day with a food conversion of below 3 lbs. meal per 1 lb. liveweight increase have been obtained with an all-meal diet containing only three per cent fiber. The meal mixture consisted of 10 per cent fish meal, 50 corn and 40 low-fiber wheat, with added vitamins and an antibiotic.

In practice it is difficult to devise diets of much below five per cent fiber when they are based on barley meal and fine wheat middlings, and it would seem, therefore, that with this type of meal mixture the question of the lower limit of fiber is an academic one.

Fiber is poorly digested by growing pigs, therefore fibrous foods lower the nutritive value of meal mixtures in which they are included. Nevertheless, their use, in limited quantities, would be economically justifiable if they were cheap and if the reduction in price more than offset this lowering in food value, thus reducing the cost of feeding.

In point of fact, however, such fibrous foods as are available, *e.g.* bran, oats and oatfeed, are at present almost as expensive as barley meal and fine wheat offal of lower fiber and high-energy contents. The use of such fibrous foods, therefore, does little *directly* to lessen the feedingstuffs bill.

As has been mentioned earlier, it is sometimes suggested that a moderate amount of fiber is of benefit to pigs by helping to maintain superior conditions in the gut. It is argued that the other ingredients of the food are better utilized, resulting in better growth rates and food conversion, and that because of this the use of fibrous foods *indirectly* lowers costs of production.

An extension of the argument is that such fiber-fed pigs, because of their thriving condition, do not give a growth response to antibiotics. On the other hand, concentrated starchy diets of lower fiber content are considered to give rise to inferior conditions in the gut, and thus to a lack of thrive in the pigs, which is responsive to antibiotics.

The recent Hillsborough experiment referred to above gives information on this point. Two diets were used, the one already given having three per cent fiber and in the other this level was raised to six per cent by the use of wheat middlings of a higher fiber content, and of barley meal.

The pigs (Large White) were individually trough-fed to appetite twice daily.

It is apparent from the results that the additional three per cent fiber in the diets, far from exerting any improvement in growth rate, was associated with retarded liveweight gains and poorer food conversions, due presumably to the lower nutritive value of the medium-fiber meal.

There was no difference in the response to penicillin, at any stage of growth, between the pigs on the two types of diet, the final result being a small improvement in growth rate and food conversion in both cases.

The results of trial A, which confirm others carried out at Hillsborough in recent years, demonstrate that the main effect of fiber in pig meals, even at fairly low levels, is to lower the nutritive value of the food. Fiber, therefore, acts as a form of food restriction.

Under present conditions of grading and prices there would appear to be little point in striving for lower fiber levels than the six per cent. The question arises, however, as to whether or not higher fiber levels might be an aid to methods of food restriction.

Trial A gives some idea of the impact of fiber levels on food intake and on grading when the meal was fed wet in troughs. Since the pigs were fed to appetite twice daily there would still have been considerable scope for food restriction by reducing the meal allowance without having to resort to high-fiber meals.

Today's farm worker produces food and fiber for himself and 23 other persons. Five years ago he produced for himself and 17 others.

In general there would appear to be no very great necessity for high-fiber feed where trough feeding twice daily is practiced. Where fairly severe restriction is required, however, extra fiber, because of its indigestible character, could perhaps be used to advantage by enabling a reduction in growth rate towards the end of the fattening period to be obtained without too drastic a curtailment of the meal allowance.

With the self-feeding of dry meal *ad lib*, a different set of conditions obtains, and it might be thought that this system offers more scope for meal of higher fiber content. A further Hillsborough experiment touches on this question.

This trial (trial B) included diets with three different levels of fiber—three, six and nine per

cent. The first two were of the same composition as in trial A; the additional fiber in the third was added in the form of oat-feed. The pigs (Large White) were individually penned, and fed dry meal *ad lib.*

It is clear that under the conditions of the trial the increased levels of fiber were very effective in bringing about reduced growth rates. Even in treatment II (medium-fiber) the extra food eaten by the pigs did not compensate for its lower feeding value, as compared with that of treatment I, and this state of affairs is further accentuated in treatment III. By thus indirectly limiting the food utilized by the animals, the fiber acted in the same manner as deliberate restriction of food intake.

The close correspondence between the growth rates of the pigs on the low and medium-fiber diets of trials A and B enables a comparison to be made of the relative food conversions. As often happens, the pigs with set feeding times were more efficient than those fed *ad lib.*

The deteriorating effect of slower growth rates on the quality of backfat is brought out by the figures for the chemical determination of iodine value (trial B) which increases with increasing softness of fat.

Financial Results

Financially, the results in the two trials for the low and medium-fiber diets were much the same, the cash value of the superior grading of the medium-fiber pigs tending to be offset by the cost of the additional fiber and by the somewhat lower killing-out percentages.

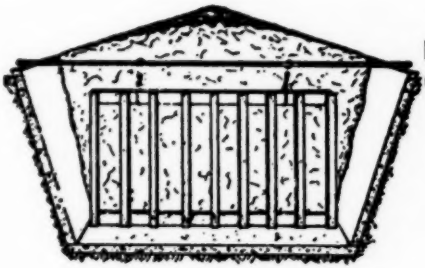
The average porcupine has about 25,000 quills.

As with restricted feeding, so with *ad lib* feeding, and here again there would seem to be little point in seeking to raise the amount of fiber above the ordinary level of about six per cent (except, perhaps, in the later stages of fattening) for the purpose of severe restriction.

Experience at Hillsborough, however, has often been that increasing the level of fiber in *ad lib* feeding can easily be overdone. It would appear that if a critical level is exceeded, another factor, perhaps one of palatability, comes into play so that the pigs go off their food and virtually stop growing.

In the present experiments this complication was avoided by the generous allowance of fish meal. This means, however, that the pigs on the higher levels of fiber would probably have made still poorer growth and food conversion had less fish meal been used.

Beef Cattle Do Well At Self-Feeding Bunkers



Experience shows what you may expect . . .

Condensed from
Kansas Farmer

Dick Mann

WILL self-feeding bunker silos work as well for beef cattle as they do for dairy cattle?

Several farmers in Barton county Kansas, have been using them during the last year, and their reports are interesting. Perhaps their experience will help you decide whether this type of silage feeding is right for your farm.

Louis and Virgil Hauser, who have a beef cow herd, built a 14½- by 80- by 7-foot bunker with a rated capacity of 180 tons. Ready-mix concrete and tilt-up method of construction were used, and total cost was $1,200.

A gate arrangement at one end is constructed to allow cattle from any 1 of 3 lots to have access to the bunker. During the last year, 35 beef cows were self-fed silage.

The feeding gate on this silo consists of a battery-charged electric fence. On this type gate, Virgil Hauser comments: "We had trouble at first with cows rearing up their heads and breaking the wire. We eliminated the problem by clamping tin shingles to the wire with metal screws. Shingles were spaced 3 inches apart. Since then the gate has been very satisfactory. It takes only 10 to 15 minutes a day to move the gate. Once a week we use a tractor and blade to clean out feeding area. Cows seem to waste less if you keep the area back of them clean. This clean-up job takes about 30 minutes."

Reprinted by permission from Kansas Farmer, 8th and Jackson Streets, Topeka, Kansas

Hausers have had more spoilage than they like. It was caused mostly by water accumulating in the troughs and soaking down the sides. They hope to overcome this to some extent this fall by flattening the top rather than rounding when filling.

Total 1959 consumption of beef may just about equal last year's —80 pounds per person.

Before they built their bunker they had been using a pit silo. "It took us 45 minutes to one hour per day and the use of a tractor and trailer to feed the same number of cattle," reports Virgil. "It was the hardest kind of work, too."

The Hausers didn't have much trouble with snow in their bunker last winter so were satisfied on this point. Their cows get alfalfa and prairie hay in addition to silage.

Fred and Harold Muller have a bunker 18 by 80 by 7½ feet with a rated capacity of about 200 tons. They also self-fed 35 beef cows last winter, starting October 27. By mixing their concrete and providing much of the labor and equipment for the tilt-up construction their silo cost only $935, including cost of 4 steel gates to close off the silo when not in use.

This bunker silo was built with the floor sloping from center to both ends so self-feeding can be done from either or both ends. The Mullers fed from only one end this last year, using a wooden stanchion-type gate that slides on skids.

Gate position was adjusted once a day and very little spoilage was reported. Fred Muller says: "A self-feeding bunker does need daily personal attention, as in extreme cold weather frozen silage along the sides will keep the gate from sliding forward as the cows push against it."

The Mullers mixed their concrete and used reinforcing mesh in the floor, which is extended in an apron 10 feet beyond each end to carry moisture further out. "If I were doing it again," says Fred Muller, "I would put a dip in the aprons and drain water to the side."

Poultry scientists say culling of the laying flock should be done at night with the help of a flashlight to keep disturbance of the hens at a minimum.

It takes the Mullers not more than 20 minutes a day at the silo, and they let clean-out chores go 4 weeks at a time. Then it takes up to an hour with tractor and scoop. Before building the bunker, the Mullers were hauling

from a standard trench. "We had a quarter-mile haul, and it took a good hour each feeding. Sometimes we had to use a tractor to pull the loaded truck out of the mud. That all has been eliminated with the bunker."

The Mullers do have one word of warning about a bunker. Be sure it is long enough. Here's why, according to Mr. Muller: "When filling, you just about need a crawler tractor to pull the load up after the silo gets about half full. When you put a crawler, a second tractor and a silage trailer in line you have a regular train and need room in which to operate. You could use a cable to pull the load up as a substitute for the crawler tractor but it does pay to have plenty of length. We think our 80-footer is on the "short side."

Homer Livingston has a bunker 24.2 feet wide at the bottom and sloping to 26.6 feet at the top and 104 feet long. It has a capacity of 600 to 650 tons.

In the fall of 1958, Mr. Livingston started self-feeding heifers weighing an average of 425 pounds. The silage used was a mixture, with 100 tons of alfalfa later covered with Atlas.

His calves didn't do at all well at the start of the season, and he finally discovered they were eating about 50 pounds of silage a day and not balancing their ration. Actually, he said, they were getting only about 9 to 9½ per cent protein when they needed 13 to 15 per cent.

Mr. Livingston solved his problem by shutting the bunker in the morning and feeding in the bunks, along with pelleted supplement. Loose hay also was supplied in racks.

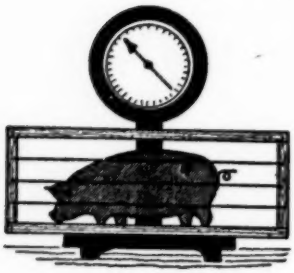
Next year he hopes to start with larger calves—500 to 550 pounds—and will self-feed silage but give the calves 2 to 3 pounds of Purdue Supplement A daily, plus some chopped hay.

Lime Improves Field Crops

Farmers now use only about 10 per cent of the lime needed each year on crops and pastures, and most of this goes on grazing crops, according to R. A. Wasson, Louisiana State University. Lime on upland acid soils can profitably increase yields of cotton and corn. Lime benefits crops by improving the growth of cover crops, by increasing the availability of soil phosphate and by helping crops to utilize applied nitrogen.

—Louisiana State University

Corn Feeding Comparisons



Purdue experiments show fattening cattle can be fed corn free choice safely and efficiently with proper supplement controls . . .

Condensed from
The Shorthorn World

THERE are almost as many ways of feeding fattening cattle as there are cattle feeders.

Many feeders follow some modification of hand feeding whereas others practice some modification of self feeding. Similarly, some prefer to feed ground ear corn while others prefer to feed shelled corn to their feeder cattle which are on full feed. Therefore, a factorial experiment was designed to compare four such feeding methods in which two lots of cattle were self fed and two lots were hand fed. Also, two lots were fed a full feed of ground ear corn and two lots were fed a full feed of whole shelled corn.

This experiment was designed to study three objectives:

1. The comparative value of hand feeding vs. self feeding.

2. Shelled corn vs. ground ear corn on a hand fed and a self fed basis.

3. The amount of salt necessary to control the intake of supplement fed free choice to cattle self fed on shelled corn and ground ear corn.

Experimental Procedure

Eighty Shorthorn calves averaging 485 lbs. were divided into four lots of 20 each, on the basis of liveweight and apparent thrift, and were fed a fattening ration of a full feed of corn, 2.5 lbs. Purdue Supplement A, free choice hay and minerals. The specific treatments were:

Lot I—*Shelled corn, full feed, hand fed;* Supplement A, 2.5 lb.; hay and minerals free choice.

Lot II—*Ground ear corn, full feed, hand fed;* Supplement A, 2.5 lbs.; hay and minerals free choice.

Lot III—*Shelled corn, self fed, free choice;* Supplement A with salt, free choice; hay and minerals free choice.

Reprinted by permission from The Shorthorn World, 16 South Locust Street ,Aurora, Illinois

Lot IV—*Ground ear corn, self fed, free choice;* Supplement A with salt, free choice; hay and minerals free choice.

In lots III and IV the amount of salt in Supplement A is adjusted so that the steers consume approximately 2.5 lbs. of supplement per head per day.

In lot III (self fed shelled corn, free choice) the corn was gradually raised to a full feed of shelled corn before the cattle were allowed to have free access to the corn in order to protect them from the possibility of foundering or going off feed. (In future research, cattle will be turned to full feed, free choice, or Purdue Supplement A, shelled corn, hay and minerals).

At the conclusion of the experiment the four lots will be sold separately and slaughter data and carcass grades will be obtained.

The per cent moisture contained in the shelled corn was 16.0 per cent and that in the ground ear corn was 16.7 per cent.

Summary . . .

1. All lots of cattle grew well and there was no indication of foundering or going off feed. Therefore, any of the four methods of feeding proved satisfactory and efficient.

2. There was no statistically significant difference in gain be-

THE COMPARATIVE VALUE OF HAND FEEDING VS. SELF FEEDING AND OF SHELLED CORN VS. GROUND EAR CORN FOR FATTENING CALVES.

December 9, 1958 — April 9, 1959. 121 days.

	Hand Fed		Self Fed	
	Lot I Shelled Corn	Lot II Gr. Ear Corn	Lot III Shelled Corn	Lot IV Gr. Ear Corn
Number of steers	20	18	20	20
	Growth Data			
Weight, Dec. 9, lb.	485	484	479	485
Weight, Apr. 9, lb.	774	764	789	790
Total gain, lb.	289	280	310	305
Daily gain, lb.	2.39	2.31	2.56	2.52
	Daily Feed			
Corn, lb.	11.58	12.36	13.60	15.21
Supplement A, lb.	2.50	2.50	2.43	2.53
Hay, lb.	4.46	4.30	2.71	2.83
	Feed Per 100 lbs. Gain			
Corn, lb.	485	535	531	603
Supplement A, lb.	105	108	96	100
Hay, lb.	187	185	95	95
Feed cost per lb. gain, cents	16.2	15.5	15.8	15.3

tween cattle fed shelled corn and those fed ground ear corn under either hand feeding or self feeding conditions. However, the feed cost per pound of gain was slightly lower for the cattle which were fed the ground ear corn, in both cases.

Sales of farmland financed by land contract have about doubled since 1946.

3. Cattle self fed (Lots III and IV) gained 8 per cent more rapidly than cattle hand fed (Lots I and II, 2.54 lbs. vs. 2.35 lbs. per day). This difference was statistically significant at the 5 per cent level.

4. These data indicate fattening cattle utilize the cob portion of ground ear corn quite efficiently. If the ground ear corn required per 100 pounds of gain is converted to shelled corn equivalent, in the case of Lots II and IV, the cattle fed the ground ear corn required 10 per cent less shelled corn per 100 pounds of gain than cattle fed straight shelled corn (Lots I and III).

5. The amount of salt required to control the intake of free choice Supplement A in Lots III and IV varied. More salt was required to control the free choice supplement in Lot IV (ground ear corn) than for Lot III (shelled corn) but ranged on an average of from 3 to 7 per cent total salt. The average amount of total salt required to control the Supplement A intake to approximately 2.5 lb. per day for the 121 day period was 3.2 per cent for Lot III (shelled corn fed free choice) and 5.7 per cent for Lot IV (ground ear corn fed free choice). However, the amount varied greatly from time to time.

The difference between what you make and what you spend is probably what you owe.

6. This research has shown that fattening cattle can be self fed free choice safely and efficiently on either ground ear corn or shelled corn, Supplement A (with from 3 to 7 per cent salt), hay and minerals.

One cow producing 10,000 pounds of 4 per cent milk per year will return as much income beyond feed costs as three cows that produce 5,000 pounds of 4 per cent milk. Also, three low producers require three times as much labor as one good cow. Keep dairy records so you can cull out low producers.

—A. I. Digest

We Need To Remodel Our Livestock

Take a close look at livestock in our show rings. Do they really fit today's market needs?

Condensed from
Massey-Ferguson Farm Profit

Dr. Ray Woodward, U. S. Range Livestock Experiment Station

CHANGES in market demand present a real challenge to livestock breeders.

It is necessary to look ahead to see what consumers will be wanting years in advance. Livestock breeders just can't "retool" to meet new consumer preferences in a hurry—particularly with beef cattle. So far the only thing we have done about Mrs. Housewife's current preference for less fat and more lean is to shorten the fattening period.

Both breeders and researchers are in general agreement that we need some new live animal judging and selection standards. The most important need in the industry today is carcass improvement. Unfortunately, there is a more important obstacle than just time involved in changing our beef cattle. The fact is, *we aren't exactly sure how to do it!*

When beef cattle are led into the show ring at your fair, take a look at our present standards of selection. Approved beef type calls for width, blockiness, smoothness and balance. There is some disagreement about size (large vs. small) with a medium type currently popular. Now suppose we attempt to assess what has happened during the development of this smooth, blocky type, so well known to all livestock people. As we see it, there have been both favorable and unfavorable results. We might list them as follows:

Favorable:

Our present beef type gives us "meatier" animals than cattle popular a few years ago. This is all to the good in producing beef.

Beef cattle probably finish faster and at a lighter weight than formerly. This development fits in well with present market demand and means more profit for the feeder.

Doubtful:

There just isn't any available evidence to show progress in ef-

Reprinted by permission from Massey-Ferguson Farm Profit, 710 N. Plankinton, Milwaukee 8

ficiency of feed conversion. Unlike our present swine and poultry, beef cattle may not have realized any improvement in this very important characteristic.

When a man claims he sleeps like a baby, he does not have one.

Comparisons between British beef breeds and British X Brahman show there is little or no difference in per cent of the high-priced cuts, loin, rib, round and rump.

Unfavorable:

Several experiments indicate that the compact, short-bodied type animals may be less productive than long-bodied cattle both in terms of growth and carcass utility.

British breeds have been found to have a lower percentage of hind quarter and a lower dressing percentage than British X Brahman cattle.

Breeding for heavier hindquarters and a higher per cent of high priced cuts has been our objective for years. It comes as a bit of a shock, therefore, when we realize we haven't increased the overall percentage of either.

The list of other conformation characteristics for which we now select without factual evidence to prove their value is long enough to be surprising. Without including the fancy points—color markings, head shape, tail head settings, etc., here are a few examples:

Deep bodies—if this characteristic is associated with constitution and vigor, well and good. But it may reflect a high percentage of offal—and a lower dressing percentage.

Wide chests—if associated with vigor we should continue to select for wide chests. If not, we are only producing a carcass made up of a higher percentage of brisket.

Smoothness — we recognize smoothness as necessary in the sense that we don't want the old patchy-fat type. However, we could be getting live animal smoothness at the expense of adding too much external fat. Muscular animals aren't too smooth. They bulge a little here and there.

Now let us assume for a minute that we had put our finger on some of the more important fallacies in our present ideas on proper beef type. How should an ideal beef steer then look? Here is a possibility. He would have an extremely long and wide back, be shallow bodied and narrow chested, and still be as heavy as possible in the hindquarter. He might show muscling at the expense of smoothness.

This composite is a little hard

to visualize. But it very closely describes the type selected for in such outstanding bacon type hogs as the Danish Landrace or Welsh.

Now the beef cattle picture is not all black since we already have some information which should be useful in improving beef quality and the utility value of the carcass. Selection for increased body length looks promising.

Tenderness of meat appears to be related to the temperament of the bull. Good disposition means tender meat. This characteristic has long been recognized in handling animals just before killing but apparently is more basic than once thought.

We are finding several sample areas which closely reflect the entire carcass. The area and fat covering of the long back muscle is one of them. The lean, fat and bone composition of rib cuts are another. Such findings are very important in reducing the cost of meats research.

We also know that there is a wide inherent difference in proportions of lean, fat and tenderness. It should be possible to pick out lines of cattle that are capable of producing superior quality beef.

A lot of research is ahead. The job of relating selection of breeding cattle to carcass improvement is a job for the entire beef industry. It cannot be made the responsibility of the breeder alone. The challenge is a tremendous one for everybody concerned.

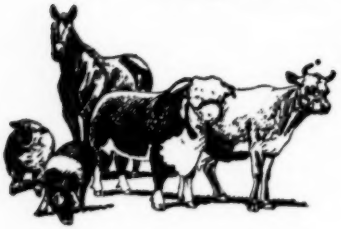
The Farm Market Holds Its Own Despite Dwindling Rural Population

Only one of eight persons today lives on a farm, compared with one of three in 1910. But to keep output rising, farmers probably will spend $17 billion this year for machinery, fertilizer, seeds and other non-consumer items. That's double the expenditures of just 20 years ago. Investment per worker on many Midwest farms is $55,000, almost four times the average per industrial worker.

Farmers spend more than city folks for many items. One reason: A third of farm families have over five persons, while only a fourth of non-farm families are that large. Farmers own a fourth of all the nation's trucks, buy more gasoline than any other industry. They spend a larger percentage of their income on clothing and medical care, too.

—Wall Street Journal

Tranquilizers and Livestock



"Nerve-soothers" are being used for livestock production . . .

Condensed from The A. I. Digest

John B. Herrick

A few years ago when the antibiotics first were available for livestock producers they were used for every ailment observable. I distinctly remember a hog raiser pouring pound after pound into his swill barrel for a group of cholera infected hogs.

After a period of overuse and some abuse, with the creation of antibiotic fast organisms, etc., the antibiotics are being used more intelligently. The advent of tranquilizers may be in the same position. Basically the drugs are nerve-soothers and in livestock production are being used for (1) increasing feed efficiency, (2) increase weight gains, (3) sedative prior to surgery, handling, etc., (4) calming effect to overcome fear, etc., when moved. In other words they are used for nutritional and medical use.

The drugs work on the central nervous system in livestock, depressing certain sections of the brain. There are a number of the drugs on the market under different names, many of them having different potency thus possessing varying dosages. The drugs are available in the injectable and tablet form.

In the Feed:

The effectiveness of tranquilizers in the feed as reported by the companies producing the product appears quite dramatic. Reports of increased weight gains, particularly when combined with hormones and antibiotics, have been as high as 15 to 17% in both sheep and cattle. The results have not been gratifying in poultry tests. Most certainly more field trials and research will need to be done before all the facts are known on the drugs as feed additives.

Georgia realizes more than twice as much money yearly from trees as from cotton.

Medication:

The most practical application

Reprinted by permission from The A. I. Digest, 8 North Ninth St., Columbia, Missouri

to date of the drugs are the "calming" effect when used on animals prior to shipment, weaning or change in surroundings. Shrink, one of livestock man's biggest losses, has been reduced considerably when tranquilized animals are weaned or subjected to stress. Weight loss during shipment can amount to around 8 per cent of the total body weight. Tests show that this can be cut in half when animals are tranquilized.

Belligerent and nervous animals may be more easily managed prior to handling. Nervous sows, unmanageable milk cows, animals in pain, noisy or overactive animals all may be quieted with the drug. Veterinarians find the drugs have tremendous value in preparation of animals for surgery or examination. A good example of this was the examination of the foot of a tranquilized bull without any restraint other than a halter. The bull normally was unmanageable and vicious. Thus, there are many uses for the drug.

Agricultural engineers recommend that infrared heat lamps be stored in their original cartons. Scratches can be avoided if the bulbs are kept away from rough surfaces such as concrete. Defective units should be discarded.

Abuses in Use:

However there are some misuses or disadvantages that livestock producers should be aware of. Probably the most misuse was observed during the season of county and district fairs. Animals were observed tranquilized that were so depressed they could not be moved out of their stalls to be exhibited. In one case a large beef bull was down for three days because of an overdose of the drug. Due to overdoses and extreme heat, sows were reported to have died of heat exhaustion when tranquilized. In many show rings exhibitors were seen pulling "numb" animals around the ring that prior to treatment were not halter broken and were unmanageable. Livestock exhibitors must take a second "look" at such practices and so should livestock judges. Most certainly the leaders of our junior exhibitors have an obligation to see that animals have been trained instead of injected. The purpose of club work is to become acquainted and know how to handle livestock.

Attempts to Avoid Shrink:

Another disadvantage of the drug is the treatment of animals prior to movement to market to avoid shrink. The drugs for this purpose have not been okayed by the Pure Food and Drug Ad-

ministration, yet packers report animals are found in the markets that have been tranquilized and the biggest disadvantage is the amount of trim necessary at the point of injection. This may be due to improper administration and the fact time is not allowed for full absorption of the drug. In one lot trim of one to four pounds was observed off the round of 18 choice beef steers.

Effect May Vary With Individuals

The third disadvantage or precaution in handling the drug is individual hypersensitivity or idiosyncrasy to the drug. In certain animals particularly in horses the exact opposite of the desired effect is obtained when the animal is tranquilized. Recently a meek Jersey cow was observed to be unmanageable when tranquilized for purposes of test surgery. Excessively fat sows have also exhibited untoward reactions because they were overdosed in that the dose was given for total body weight and in obese animals the fat is relatively inactive metabolically.

Points of Significance In Using Tranquilizers

1. Their use in the feed for "nutritive" value requires further investigation.

2. Tranquilizers should not be used in animals prior to slaughter.

3. The drugs vary in potency and dosage is critical thus promiscuous use of the drugs should be discouraged.

4. There is a "moral" obligation to be considered when the drugs are used on animals to be exhibited.

5. The drugs are of tremendous economic value when used to avoid shrink and to reduce stress when animals are being shipped to the feed lot.

6. Don't attempt to substitute tranquilizers for good management practices like so many livestock producers did with antibiotics.

Artificial Chick Now Can Control Infrared Brooder

Infrared lamps in brooder houses have been used for several years. Now U. S. Department of Agriculture researchers have come up with a small globe-like gadget that reacts to temperature just like a baby chick.

Moreover, the invention is designed to control infrared lamp temperatures.

The artificial chick is a four-inch black globe, giving off heat just like the real thing. An electrical resistance element inside the globe can control electrical current.

Pregnant Sows Need Special Care

Don't wait until farrowing time to tend to your sows . . .

Condensed from
Wisconsin Agriculturist

WHEN a brood sow fails to farrow or raise a large litter, it's not just tough luck. There is a reason.

Sows that get good care and receive enough of the right kind of feed will almost always farrow large and healthy litters. Large pigs stand a better chance of surviving and of getting off to a better start.

Care of sows should begin two or three weeks before breeding, not two weeks before farrowing. The physical condition of a sow or gilt at breeding time has an influence on the number of pigs that they farrow.

Extremely fat sows may not settle. For this reason, it's a good idea to make sure sows aren't overly fat at breeding time.

Flush Sows and Gilts

Excessive fat interferes with the release and fertilization of the eggs. Fat sows that do settle are apt to raise only small litters.

Flushing sows and gilts is always a good idea because it stimulates the release of additional eggs. Start flushing two to three weeks before breeding. A ration with about 18 per cent protein is ideal.

Continue liberal feeding for two to three weeks after mating. This gives fertilized eggs time to become attached in the sow's uterus. Then reduce the amount of feed and drop the protein level to about 16 per cent.

Feed pregnant sows a ration containing plenty of bulky feeds. Include cereal grains such as barley, corn and oats in their ration. Keep sows in medium flesh and gaining just a little weight.

Try to regulate the feed so that sows gain from 2/3 to 1 pound per day. If hand-feeding, give sows 1½ pounds of grain and protein supplement daily for each 100 pounds of live weight. Feed gilts about 2 pounds daily for each 100 pounds of live weight.

For example, a 300-pound sow should get 4½ pounds per day. And a 250-pound gilt should be

Reprinted by permission from Wisconsin Agriculturist, Racine, Wisconsin

fed about 5 pounds of feed per day.

This is only a general rule, however. Fat sows may not need this much. Thin sows may need more. Use the rule as a guide, but use your own good judgment, too.

For every 8 pounds of wood used in pencils, 14 are wasted in the factory and 9 more in the forest.

Sows should gain 75 to 85 pounds during gestation and gilts 100 to 125 pounds. Since 75 per cent of the growth of the developing litter takes place during the last month of pregnancy, increase the protein supplement so that each sow gets about ½ pound per day during this time.

To save labor, you may wish to self-feed sows. If so, be sure and increase the amount of fiber in the ration or the sows may get too fat.

Allow 1 foot of feeding space for every two or three animals when self-feeding. Provide 1½ to 2 feet of trough per animal when hand-feeding.

In order to prevent injuries, be sure and separate bred sows from the rest of the herd. It is also desirable to separate gilts from heavier sows. Otherwise, the larger hogs will push the smaller animals aside and consume more than their share of the food.

Don't overlook the water supply. Sows need a good supply of clean and fresh water available at all times. Even in cold weather, a brood sow needs to drink at least a gallon of water per day. If the water is cold and dirty, chances are she won't drink all the water she needs.

The best way to provide hogs with water is with an automatic watering system. Provide at least one automatic watering cup for each 10 sows.

Check for Lice, Mange

Check sows for lice and for mange frequently during gestation. Treat infected animals by spraying with a lindane solution. Add 1 pound of 25 per cent lindane to 50 gallons of water and cover the animals thoroughly.

Strive for larger litters and heavier pigs at birth. Heavier pigs mean more potential profit.

A pig that weighs 3 pounds at birth will weigh 40 pounds or more at eight weeks of age. Also, they can be ready for market 10 to 14 days sooner than a 2-pound pig and they take less feed to get there.

Start giving sows and gilts the care they need before they are ever bred. Don't wait until a week or two before farrowing time.

One Calf Per Cow Per Year

Best time to breed a cow is from 50 to 90 days after her last freshening . . .

Condensed from
Vermont Farm & Home Science

W. D. Bolton, University of Vermont

WANT a tax-free farm? If you're an average dairyman, your herd could provide enough additional income to pay your property taxes—if each of your cows produces a calf every year.

Few herds reach this goal and the resulting loss exceeds 5 million dollars annually. Most dairymen are unaware of the loss since it represents milk that was never produced.

Breed After 50 Days

To produce a calf annually and thus start a new lactation, a cow must conceive within 90 days after her last freshening. Research shows the best time to breed cows is from 50 to 90 days —animals bred earlier often do not settle and may not finally conceive until well after 90 days. Loss of potential milk production costs the owner over a dollar a day for each cow that goes more than three months without conceiving.

Breeding problems include abortions, birth of dead or weak calves, repeat breeding animals, failure to show heat, and, in general, any condition that interrupts the normal breeding cycle. If your cows are requiring two or three services per conception, you've got trouble. An average of one and one-half services, or slightly more, is normal.

What causes breeding problems? Bacteria, nutrition, heredity, hormone imbalance, mechanical injuries, and poor management—these all contribute to your economic loss.

Bacteria Causes Abortions

In examining over 600 aborted calves during the past eight years, the Department of Animal Pathology in Vermont found that bacterial agents were involved in only one-third. Most of these were caused by brucellosis, vibriosis, and leptospirosis.

Nutrition is not a frequent cause. However, recent research in Missouri and Wisconsin shows nitrate poisoning may account

Reprinted from Vermont Farm & Home Science, Vermont Agricultural Experiment Station, Burlington, Vermont

for some of our problems. During drought or prolonged wet weather unusual amounts of nitrates may accumulate in some forages. We have set up laboratory tests to check on this possibility.

Heredity Usually No Problem

Since hard-to-settle animals tend to eliminate themselves from the herd, heredity rarely causes problems. Research evidence does show that some cow families are far more susceptible to disease than others. Lethal genes are known to exist in cattle, but it's difficult to determine just how much they are responsible for early abortions.

Hormone imbalance or endocrine upset is currently considered to account for a large part of our non-bacterial reproductive problems. Most research in this field is quite new and has been hampered by the expensive complex chemical and biological tests needed to determine hormone levels. Physiologists are now trying to develop fast, simple tests that will simplify herd examinations.

Heat Hormones Found in Forage

Recently research workers reported that in some types of forage they found hormones in large enough quantities to produce heat. This probably explains why both pregnant and nonpregnant cows sometimes show heat about 10 days after being turned into good forage in the spring.

Mechanical injuries are usually overrated as a cause of abortions. Cows will withstand severe injury or sickness before they will abort.

Cows eat more low quality hay if it is ground, Purdue University dairy scientists point out. Coarse ground hay is more easily digested than finely ground and there is less chance of decreasing fat content of the milk.

So we come to improper herd management — the cause of at least a third of dairy breeding problems. Our farm visits with the local veterinarian to herds in trouble indicate that poor management is as often responsible as disease. Failure to detect heat, absence of periodic pregnancy checks by the veterinian and a general lack of good "cow sense" on the part of the herdsman—these are the most frequent criticisms.

Turn Cows Out Twice Daily

Bearden at Cornell University has shown that dairymen can improve breeding efficiency more than 5 percent by turning cows out once daily, compared to no turn out; twice-a-day figures show over 6 percent increase. At current milk prices, dairymen lose about $45 a month for each

cow that remains open 90 days after freshening. So, early detection of just one of these animals more than pays for the cost of pregnancy checks.

The only "well enough alone" we should let alone is the one that produces water.

"Cow sense" is hard to define. The herdsman who has it understands and appreciates the current needs of his animals. He shows it in many ways, such as his methods of handling, feeding, milking, and caring for his cows, knowing when to call the veterinarian, in the general appearance of his herd, and the amount of bedding used. You can gain it only through experience in working with animals. Frequently cow sense makes the difference between just breaking even and a substantial profit from the dairy enterprise. There's no substitute for it.

If you've encountered breeding problems in your dairy herd it will pay you to follow these recommendations:

1. Use artificial breeding. Put your own bull "on the shelf" until he has passed a laboratory examination.

2. Have periodic pregenancy checks. Ask your veterinarian to examine any cows that do not show heat within 30 days after calving.

3. Call your veterinarian for repeat breeders. He may suggest blood samples and tampon tests for his diagnosis.

4. Send aborted calves and a blood sample from the dam to your Department of Animal Pathology.

5. Turn your cows out at least daily to get the extra 5 to 6 percent breeding efficiency.

6. Use cow sense.

All-Time Records

Tree planting in the U. S. has more than doubled in the past five years. During the year ending last June 30th, more than 1,568,700 acres were planted — an all-time record and twice the planting total for 1953. The 1958 planting was more than 10 times greater than the 138,970 acres planted in 1930.

These figures, from the U. S. Forest Service, underscore the growing interest in tree planting by private landowners and the mounting demand for woodland products. State Foresters as well as industry and commercial operators have expanded their nursery capacities to meet the increasing demand.

—The National Assoc. of Soil Conservation Districts

ONE YEAR CONTINUING INDEX

BEEF CATTLE

Happy Days for Cattlemen .....Nov. 1958
Control Feedlot Diseases .....Nov. 1958
Tough Question for Cattle Feeders Nov. 1958
Give Us More Crossbreds .....Dec. 1958
Half A Ton More Beef .....Dec. 1958
Measuring Fat in Beef .....Jan. 1959
Cattlemen See Research .....Jan. 1959
Steer of Tomorrow .....Feb. 1959
What Costs to Feed Beef Cow ....Feb. 1959
Scales Supplement Eye .....April 1959
Beef Feeding .....April 1959
Feed Steers on Slat Floors .....April 1959
Semen Test for Bulls .....May 1959
Selecting Breeding Stock .....May 1959
Look at Beef Carcass .....July 1959
Brew Shaking Cattle Business .....July 1959
Figure Profit, Loss on Cattle ....Aug. 1959
71% of Calves in 3 weeks .....Aug. 1959
Pellets for Beef Calves .....Aug. 1959

CONSERVATION

Smooth Out Rough Spots .....Nov. 1958
Upside-Down Land .....Dec. 1958
Beef Cattle Finance Soil Improvement Dec. '58
Can You Pay to Rebuild Farm ....Feb. 1959
Strips for Wind Erosion Control ...May 1959

CROPS

Rotations Obsolete? .....Nov. 1958
Bigger Wheat Yields .....Nov. 1958
Soybean Diseases .....Nov. 1958
Cotton Without Cultivation .....Dec. 1958
No. 1 Soybean Threat .....Dec. 1958
Crashed 200-Bushel Corn Barrier ..Dec. 1958
The Blackbird Problem .....Dec. 1958
Protect Stored Corn .....Jan. 1959
Mechanized Cotton .....Feb. 1959
Corn in 21-Inch Rows .....Feb. 1959
Certified Seed Pays .....March 1959
Why Corn Lodges .....March 1959
How's Plant Population .....March 1959
Minimum Tillage Pays .....March 1959
New Sod Crops for Corn .....March 1959
Costs to Raise Corn .....March 1959
Corn Plagued by Aphids? .....April 1959
Your Own Test Plots .....May 1959
Soybeans as Feed Crop .....July 1959
What They Do with Oats .....July 1959
Gibberellic Acid Promise .....Aug. 1959

DAIRY CATTLE

Coddle Dairy Calves .....Nov. 1958
Dairy Cow and Balanced Ration ..Dec. 1958
Breed Dairy Heifers by Weight ...Dec. 1958
Automation and Dairy Profits ....Dec. 1958
Parlors vs. Stanchions .....Dec. 1958
Menace of Mastitis .....Dec. 1958
How Co-op Milking Barns Work ..Dec. 1958
Artificial Breeding of Age .....Jan. 1959
Pie-Shaped Dairy Lots .....Jan. 1959
Ventilate Your Dairy Barns .....Feb. 1959
Herringbone—Cow Barn Fashion ...Feb. 1959
Our Cows Must Have Twins .....Feb. 1959
Bulls for Dairy Beef .....March 1959
Low Cost Testing .....April 1959
Dairying in 49th State .....April 1959
Grain to Dairy Cows .....April 1959
Cash in on Dairying .....April 1959
Twin Calves and Infertility .....May 1959
Watch Ketosis .....May 1959
Controlling Sex of Offspring .....May 1959
Protecting Milk .....May 1959
Milk Cows or Raise Heifers .....May 1959
More Milk with Psychology .....July 1959
Small Dairy Farm Survive? .....July 1959
Drylot Feeding Looks Good .....July 1959

FARM BUILDINGS & SHOP WORK

The Power Saw .....Nov. 1958
Bull Pen Makes Silo .....Nov. 1958
Keep Tractor Costs Down .....Nov. 1958
Couldn't Afford Old Buildings ....Nov. 1958
An Eye on the Wire .....Dec. 1958
Make Posts Last Longer .....Jan. 1959
Durable Concrete .....May 1959

FARM MANAGEMENT

Are Corn Prices More Stable? ....Nov. 1958
New Farm Law .....Nov. 1958
Why Southerners Scouted Corn Belt Nov. 1958
Will There Be Enough Farmers? ..Dec. 1958
Family Farm in Changing Ag. ...Dec. 1958
Contract Farming in Hen House ..Jan. 1959
Farm Outlook for 1959 .....Jan. 1959
Will You Get the Loan? .....Jan. 1959
Take a Farm Inventory .....Jan. 1959
Use Market News .....Jan. 1959
New Packers, Stockyard Act .....Feb. 1959
Social Security Important .....Feb. 1959
Small Farms Make Profits .....Feb. 1959
Farm More Efficiently .....Feb. 1959
Points for Careful Buying .....April 1959
Liability Insurance .....April 1959
Vertical Integration in Livestock ..May 1959
Family Farm and Future .....July 1959
Automate or Liquidate .....July 1959
Can You Stay in Farming .....Aug. 1959
Vertical Integration, Your Farm Aug. 1959
Cut Cost of Borrowing .....Aug. 1959
Don't Fear Integration .....Aug. 1959

FARM EQUIPMENT & MACHINERY

Agriculture's Air Wing .....Nov. 1958
Plow Like a Champion .....Nov. 1958
Change to Crop Drying .....Dec. 1958
Tractor Power Steering .....Dec. 1959
Tractor Motor Oils .....Jan. 1959
Systematize Livestock Feeding ....Jan. 1959
Keep Eye on Generator .....Feb. 1959
Grain Banks Save Labor .....April 1959
Clean Lots with Pump .....April 1959
Calibrating Sprayers .....April 1959
Is Bigger Machinery the Answer ..May 1959
How to Select Tractor.....July 1959
Wheels Slipping? .....July 1959
Moisture Tester for Soils, Crops ..Aug. 1959

FEEDS

Watch Out for Soft Corn .....Nov. 1958
Pellets or Wafers .....Nov. 1958
Feed to Cut Poultry Costs .....Jan. 1959
Surprising Pelleted Feeds .....Feb. 1959
Report on Feed Additives .....March 1959
New Era in Livestock Feeding ...April 1959
Balance Your Rations .....Aug. 1959
Pellets for Beef Calves .....Aug. 1959

FERTILIZERS

Stop Wasting Manure .....Feb. 1959
Make a Compost Pile .....March 1959
Plant Food Profit .....March 1959
Fertilize for Profit .....March 1959
The Elusive Element .....March 1959

ONE YEAR CONTINUING INDEX

How Much Fertilizer .....March 1959
Lime to Save Potash .....March 1959
Correct Fertilizer Formulas .....March 1959
Fall Fertilization .. ..March 1959
Manure by Irrigation .....April 1959
Substituting Fertilizer for Land ....May 1959
Quality Forage and Fertility .....July 1959
Can Fertilizer Maintain Fertility ..Aug. 1959

FORESTRY

More Money from Orchard .....Jan. 1959
Use Woodlot Wisely .....March 1959

FRUIT

Chemicals Thin Peaches .....Feb. 1959
Get Good Trefoil Stand .....April 1959

HAY AND HAY CROPS

Smaller Bales? .....May 1959
Ideas on Hay Drying .....July 1959
Cold Facts on Hot Subject .....July 1959
What About Hay Conditioners ....July 1959
Are We Wasting Roughage .....Aug. 1959
Best Use Poor Roughage .....Aug. 1959

HOGS

Making Money With Hogs .....Nov. 1958
Pig Report Spells Danger .....Nov. 1958
Hot on Hybrids .....Dec. 1958
Parasites Eat Up Pig Profits .....Dec. 1958
Breed Leanness Into Hogs .....Dec. 1958
Breeders Must Test Boars .....Dec. 1958
How Pig Crop Reports Are Made ..Dec. 1958
Making Hogs Pay .....Jan. 1959
Good Pork, Cheap .....Feb. 1959
Take Risk Out of Hogs .....Feb. 1959
Swine Fit Any Farm .....Feb. 1959
Care for Pigs Early .....March 1959
Pacemaker Hog Program .....March 1959
What Live Probing Shows .....April 1959
Keys to Swine Profit .....April 1959
Select Stock for Swine Herd .....April 1959
7-Steps for Success with Hogs ....May 1959
Machine Fed Hogs .....May 1959
Baby Pig Losses .....July 1959
Breeds for Crossing .....July 1959
Vitamins in Swine Rations .....July 1959
More Lean Pork .....Aug. 1959

IRRIGATION

Fertilizer and Water .....March 1958
Making Irrigation Pay .....April 1959

INSECTS AND INSECTICIDES

Insects in Stored Corn .....Nov. 1958
Built-in Bug Resistance .....Dec. 1958
Legume-Grass Mixtures .....April 1959
Systemic Insecticides .....May 1959

PASTURES

More Beef from Grass .....Nov. 1958
More Milk from Fewer Acres ....Feb. 1959
More Pastures This Year .....March 1959
Lespedeza Grows, Alfalfa Won't ..July 1959
Pep Up Old Pasture .....July 1959
Strip vs. Rotational Grazing .....July 1959

POULTRY

Up-To-Date Flock Manager .....Nov. 1958
Egg Production and Morning Lights Jan. 1959
Caged Layers in New York .....Jan. 1959
Hens Need Light .....Jan. 1959
Roostless Houses .....Jan. 1959
Started Pullets .....Jan. 1959
What's Ahead for Broilers? .....Jan. 1959
More Eggs, Less Feed .....Jan. 1959
Feed to Cut Costs .....Jan. 1959
Plump Turkeys, Less Protein .....Jan. 1959
Slat Floors for Hens .....Jan. 1959
Brooding Chicks .....Jan. 1959
Ahead for Poultry .....Jan. 1959
Crowding Layers Profitable .....Feb. 1959
More from Clean Eggs .....Feb. 1959
Can Poultrymen Expand? .....March 1959
How Much Crowd Layers? .....April 1959
Cannibalism .....May 1959
What About Bloodspots? .....May 1959
New Approach Flock Health .....July 1959
Produce Quality Eggs .....Aug. 1959

SHEEP AND GOATS

New Look in Sheep .....Nov. 1958
Sheep Records Speak .....Dec. 1958
Long or Short Wool? .....Jan. 1959
Alfalfa-Corn for Lambs .....Feb. 1959
Vitamin D for Lambs .....Feb. 1959
102 Ewes on 160 Day Acres .....April 1959

SILAGE

What Happens in Silo? .....Nov. 1958
Silage and Moisture .....March 1959
Latest on Grass Silage .....May 1959
Every Acre in Silo .....Aug. 1959
Bunk out of Bunker Silos .....Aug. 1959
Preserving Corn Silage .....Aug. 1959
Stop Seepage from Silo .....Aug. 1959
Make Good Grass Silage .....Aug. 1959

SOILS

Hold Quick Blow Soil .....Aug. 1958
Can Fertility Cut Pests, Disease? ..Aug. 1958
Molds in the Soil .....March 1959
Should You Fall or Spring Plow March 1959
Soil Acidity and Vegetables ....March 1959
Subsoil Rippers .....March 1959
Did Your Soil Sizzle? .....March 1959
Interpreting Soil Tests .....March 1959
Testing for Nitrogen .....May 1959

VETERINARY

More About Bloat .....Nov. 1958
Lepto A Major Threat .....Dec. 1958
Inherited Non-Lethal Traits of Cattle Feb. 1959
Oil and Bloat .....Feb. 1959
Controlling Reproductive Cycle ....Feb. 1959
Cattle Breeding Tips .....Feb. 1959
When Bloat Strikes .....April 1959
Anaplasmosis .....April 1959
Watch Ketosis .....May 1959
Foot Rot in Cattle .....May 1959
Semen Test for Bulls .....May 1959
Controlling Sex of Offspring .....May 1959
Twin Calves and Infertility .....May 1959
Vaccination Halts Lepto .....July 1959
Livestock Poisoning .....July 1959
What Do About Bloat .....July 1959
Save Barnyard Babies .....Aug. 1959
First Aid for Cow .....Aug. 1959

WEEDS

New Weed Killers .....April 1959
Don't Buy Weeds .....April 1959
Get Rid of Weeds .....July 1959

MISCELLANEOUS

Yankee Oysters, Japanese Girls ..Dec. 1958
American Visits Russian Farm ....Jan. 1959
Ancient Beekeeping .....Feb. 1959
Farmer's Lung .....April 1959
Bungling Bees and Weevils .....April 1959
When Bee Stings Hurt .....July 1959
Farm Ponds for Fun .....Aug. 1959

NEW FARM MANAGEMENT BOOKS

The new Prentice-Hall Farm Management books described below are a major advance in farm book publishing. They are beautifully bound, well illustrated, fast and easy to read. Most important, they contain the latest farm information necessary to make money farming. Order these books direct from Farmer's Digest, Fort Atkinson, Wisconsin. To prices below, add 15c for postage and shipping.

BEEF PRODUCTION

By Ronald V. Diggins and Clarence E. Bundy. Covers the problems of feeding, breeding, and management of beef cattle. The language is simple and avoids technical terms. The material is complete and logically arranged so that specific information is easy to find. Over 200 photographs and over 20 useful tables. 384 pp. Size 6 x 8⅞. Illustrated. $6.00.

DAIRY PRODUCTION

By R. V. Diggins and C. E. Bundy. A complete study of dairy farming including the latest experimental findings. Deals with every phase of the enterprise from choosing and caring for the herd to marketing the product and showing dairy cattle. 320 pp. Size 6 x 9. Illustrated. $6.00.

LIVESTOCK AND POULTRY PRODUCTION:

Principles and Practices

By C. E. Bundy and R. V. Diggins. A non-technical study of the five areas of animal husbandry — swine, cattle, cows, sheep, and poultry. Basic methods and latest research findings relating to successful livestock and poultry production are included. 608 pp. Size 6 x 9. Illustrated. $6.55.

SHEEP PRODUCTION

By Ronald V. Diggins and Clarence E. Bundy. Accurately and completely covers every aspect of the production and marketing of sheep and wool. Written in a practical, to the point manner, it is easy to read and understand. Over 200 photographs and line drawings are features. 416 pp. Size 6 x 8⅞. Illustrated. $6.50.

Soil: Use and Improvement

By J. H. Stallings. An up-to-date, complete presentation of the information necessary for successful soil conservation. How to obtain top yields and improve the soil at the same time. With 120 photographs, line charts, and graphs. 411 pp. Size 6 x 9. $5.95.

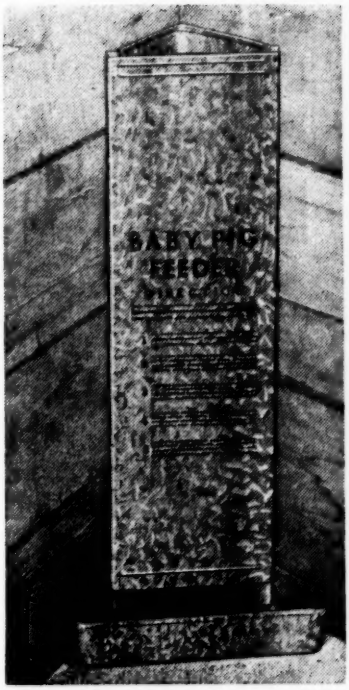
SWINE PRODUCTION

By C. E. Bundy and R. V. Diggins. A complete and up-to-date handling of swine production problems reflecting the most recent experimental data. With 50 useful tables and more than 200 selected photos and drawings. 432 pp. Size 6 x 9. Illustrated. $6.00.

ORDER FROM FARMER'S DIGEST, Fort Atkinson, Wisconsin

NEW BABY PIG LITTER FEEDER

Start pigs on new creep feeds as early as possible to make money with hogs. This new feeder fits in corner of the pig creep near the heat lamp to start pigs eating as young as five days. Helps you get fast, low cost gains. Feeder front panel adjusts to allow a little or a lot of feed in pan. Saves feed, avoids waste. When litters run together four single feeders make one large feeder. Complete instructions. 15,000 in use in Illinois. Send check to—The Highsmith Co., Fort Atkinson, Wis.



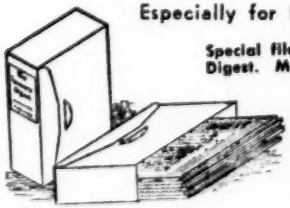
4 FEEDERS only $9.85 Postpaid

FARMER'S DIGEST FARM AND HOME FILES

8 Files of Your Choice, Only $2.95 Postpaid

Now, keep your farm business records filed neat and handy, right at your finger tips. Avoid losing expense records that save tax money. Keep machinery instruction books, crop and livestock records, etc. Made of white-lined cardboard covered with leather-like, forest green paper. Shipped folded flat. Look fine on your office or home bookshelves. Available with printed labels at right. Size 2" thick by 10" high by 7" deep. Specify files desired by number. Send check to address below.

Especially for Farmer's Digest—



Special file holds one year of Farmer's Digest. Makes a 1000-page, completely indexed library of a one year subscription. Has advantages over binding that costs $4.00 per year. Order with other files listed at right or send 50¢ for one file, $1 for three.

FILES AVAILABLE
(Order by number)

1. Contents: (You fill in)
2. Agricultural Bulletins
3. Machinery Manuals
4. Swine Records
5. Crop and Field Records
6. Paid Bills and Receipts
7. Unpaid Bills, Receipts
8. Livestock Records
9. Cow Production Records
10. Farmer's Digest
11. Reader's Digest
12. National Geographic
13. Breeding Records
14. Soil Records
15. Poultry Records
16. Social Security Records
17. 4-H Records
18. F. F. A. Records
19. Veterinary Information
20. Government Programs
21. Cancelled Checks
22. Kitchen File
23. Comic Books

Farmer's Digest, Fort Atkinson, Wisconsin

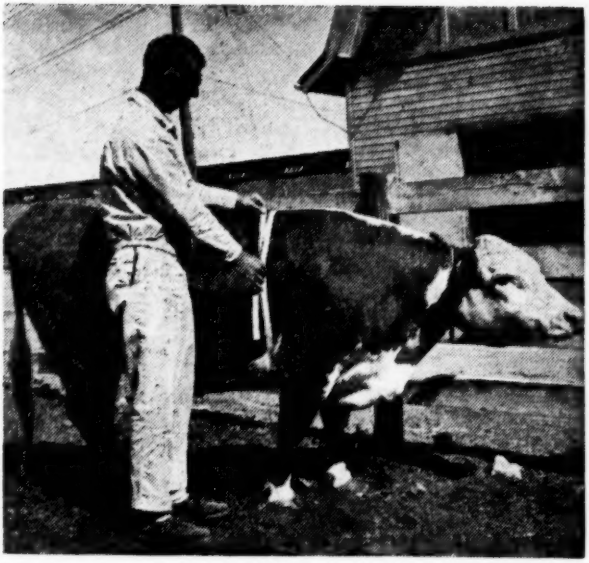
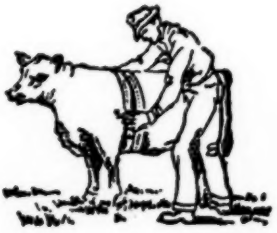
Pictured
At Right:

New Easy
Way to —

"WEIGH"

Beef Cattle

"You don't need a $500 scale to know what your feeders are doing!"



A new, low cost tape now makes it easy for you to accurately estimate the weight of your feeder and beef breeding cattle. For practical purposes, it substitutes for a scale costing several hundred dollars. Tested on experiment station beef herd, scale and tape weights differed less than 2% on total weight of 38 head. Use it to keep track of daily gain and thus check the effectiveness of your feeding program. Use it also to "weigh" fed cattle and market for the most profit. For cattle from 82 to 1888 pounds. One side estimates weight of fed cattle in grades Medium, Good, Choice and Fancy. Other side for feeder, beef breeding and crossbred cattle. To use, just place around heart girth, pull tight, and read correct scale. Side sewed 108" long, 1" wide. Extra strong, non-stretchable, plastic coated fabric in double thickness. Money back guarantee. Send check or M.O. $1.59 for One Tape, $4.49 for Three, $16.95 for Twelve. The Highsmith Co. Inc., Fort Atkinson, Wis.